

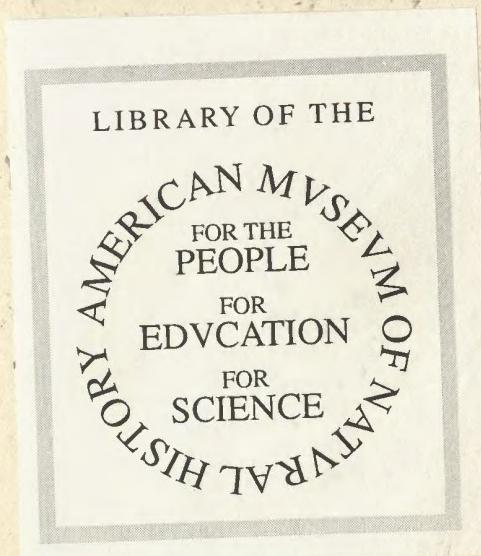
Whale Notes & Measurements
Japan 1910

R. C. Andrews

Amer. Museum of
Natural History,
Central Park West,
New York City
July 1910 U.S.A.



Kōzo - tree from which
paper is made -
made in Tosa province



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Roy C. Andrews

K. 219

Only 30 whaling ships allowed in
Japan.

Blue 62
57

running
2 larval
chum

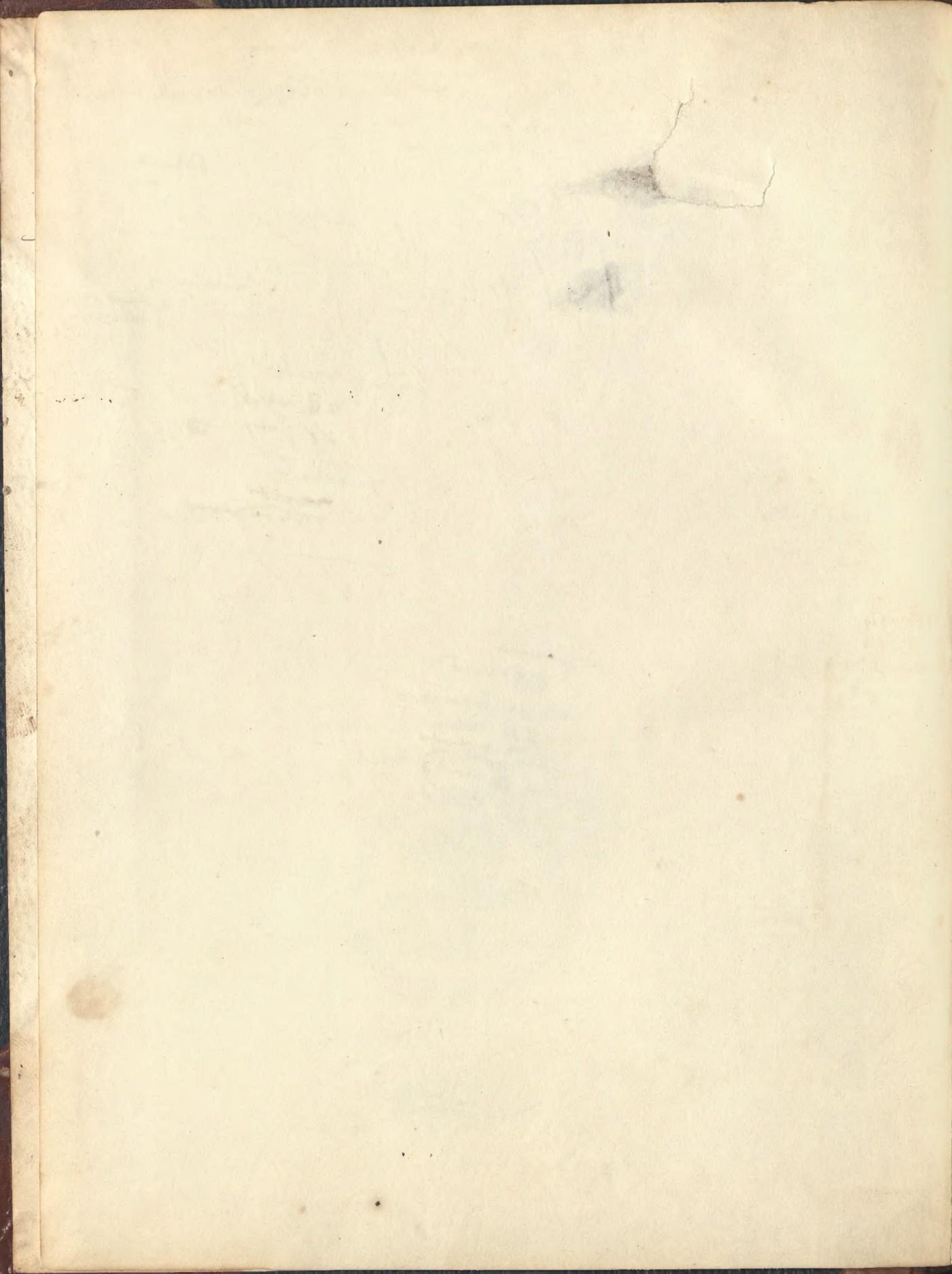
Furbock
48' west
28 ribs 4%
K.

running
water
5 or 4 madam

Sei O.K.
west 51

7
14
13
~~23~~
57

Spinn
45' west
15' chum
20' ribs
2' waves
running 3' west



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35	Blue	" 7 "
39	" "	" 8 "
42	Finback	" 9 aikawa
45	"	" 10 "
47	"	" 11 "
51	"	" 12 "
54	"	" 13 "
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2 P.M. Siwa Maru

no 745 Sei whale of Aug 23/10 Akarava

Ventral line from anus to flukes gray like sides of peduncle - naval to genitalia pinkish Posterior to fin insertion the gray on sides is very light & tinged with pinkish - only a suggestion of grayish band across abdomen - slight bluish tinge to general color. Right tip all gray to tip - rump a little lighter - Below right fin & folds grayish all tinged with pink more or less. Folds of throat white & fuscous all dark gray - folds of breast white tinged with pink and all fuscous dark gray except 11 in mid-ventral line. Top of head has two ridges parallel with median ridge but more or less broken - naval at end of fuscous

Total length by centers = 46' - 6" = 1467"

F. lobes to dorsal = 12' - 11" = 394"

" " arms = 11' - 10" = 361"

" tip to tip = 11' - 8" = 356"

Snout to blowhole = 7' - 9" = 236"

" " eye = 9" = 274"

Fin tip to bead height = 5' - 11" = 180"

" " " ant. mist. = 5' - 2" = 157"

" " " post. " = 4' - 2" = 127"

" breadth = 1' - 3" = 38"

Height dorsal = 12" (approx) = 31"

7:30 P.M. Japan

T. H. K. K.
(skeleton taken)

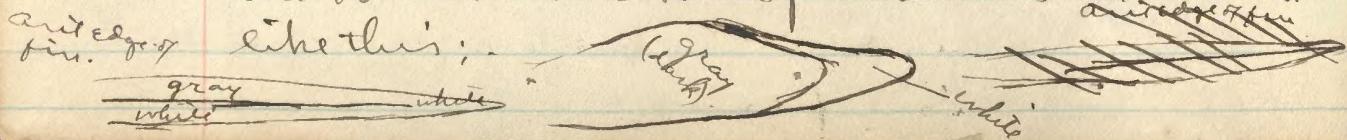
5

No. 1 Blue whale - ♀(pregnant) Apr. 4/10 Oshima, Shikoku, Id.
Contained a male foetus about 18 in. long.
Preserved.

Color A very light whale caused by a predominance of the light gray markings.
Body Top of head uniform slate-gray. From head backward to almost to dorsal, on the very median line of the back, is a narrow band of slate gray like head color. Rest of back & sides from ~~other~~ of mouth almost wholly light gray, the light markings are interrupted occasionally by small patches of the dark color - ~~for~~ large areas, however, are solid light gray with no suggestion of darker - Light markings turn downward & run along sides of furrows, meeting on median line below between navel and anus. On folds, at their ends, there are many gray-white dashes; these markings become pure white on the folds on the sides of the belly and extend forward nearly to insertion of fin - they do not meet on the median line on the folds of the belly. Under right pectoral is a white patch (broken) ^{on folds only} about 2 feet wide by $2\frac{1}{2}$ feet deep. The white markings turn upward ^{abruptly} to meeting this patch, and are both on the folds and in the furrows - Between pectorals

there are only a few light markings - in front of fins, on breast & throat, no light markings, uniformly slate gray like lead - The light gray dashes extend forward in a narrow band to ~~eye~~ a little in front & above eye - On the peduncle the light gray color predominates and is broken by darker in only a few places -

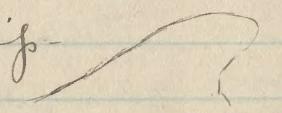
Pectorals Right & ~~left~~ are alike in color. Superiorly the distal $\frac{1}{4}$ of fin is white - this extends backward along the posterior edge to the middle of fin - ~~and~~ along the anterior edge for about $\frac{1}{3}$ of the length of the fin - rest of upper surface dark gray. The dark gray ~~of the~~ above, runs down to exact median line of the anterior edge & there meets the white of the under surface. White under surface of fin white. The pectorals of this whale are colored like those in one of the figures given by True of the Newfoundland Blue whales. It is rather unusual to see the white of the under surface approaching as the tip of the fin above. I saw it in only one of the Vancouver Pt. specimens. Fins as follows:



Fishes

Superiorly: Above dark gray. Inferiorly Flukes are marked with rather coarse white lines - which run from ant. edge & curve inward almost reaching posterior margin as in the Van. specimens - The ~~central area~~ of flukes ~~is~~ is very light (caused by the white lining) except the tip which is ^{distal 1/3} dark. Both lobes are the same in color -

Dorsal

Gray (light) caused by many wavy light gray lines which run from anterior edge (median) diagonally downward & backward over sides - a scar near tip - 

(Photographed)

Jaw
External
Character

Inside right ramus of mandible, proximal $\frac{1}{2}$ very light bluish gray, distal $\frac{1}{2}$ bluish white. Tongue bluish slate as in Van. specimens. mucous membrane in roof of mouth indigo as in Van. specimens.

External
Characters

Many of the "scar"-like spots on the peduncle, and on back, sides & proximal half of top of head. These "scars" were like those which I observed on the Vancouver Finbacks & on one or two of the Blue whales - also on one or two Alaska Humpbacks. I can see no other origin for them, ^{than} ~~except~~ that they may be due to the action of parasitic cirripeds.

Five creases run up from the posterior ~~insertion~~ insertion of fin, across its base for $\frac{2}{3}$ of the way

to the anterior edge.

Eye Below eye there are two deep creases. Two creases run out from the anterior corner - above eye are 4 short, shallow creases and one long deep one.

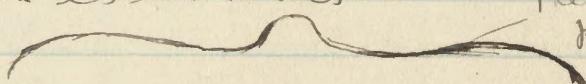
This sketch was made back
before head had been cut at
all so that it is correct.



Eye opening is
front 9.5 cent. long

The iris is brown.

The median ridge on top of the head rises gradually from the snout, the highest point being directly in front of the anterior ends of the blowholes - here it was about six inches high. A cross section of the rostrum, taken directly in front of spiracles is like this:



There are low, hardly perceptible ridges which lose themselves long before reaching snout.

The head of Van. specimens were
all the same.

As far as could be seen from color & external appearance this specimen differed not at all from the Van. Blue whale.

Measurements, see opposite page

9

Many of these measurements were taken when whale was in the water and while I believe most of them to be correct, yet I can not be certain of all.

Measurements of No. 1

cent.

1	Total length snout to notch over back =	
3	Snout to eye	=
6	" post. inst. of pectoral	=
7	" " " " dorsal	=
10	Length opening of eye	= 9.5.
16	Notch of flukes to post. inst. of dorsal	=
17	" " " " " " pectoral	=
18	Pectoral (tip to head of humerus) }	=
19	" (" post. insertion)	Right
20	" (... ant. ")	=
21	Greatest breadth of pectoral	=
22	Height of dorsal (vertical)	=
23	Flukes, tip to tip	=
24	" greatest breadth (ant.-post.)	=
27	" length left lobe (axially)	=

Pectoral - tip to head of humerus

" " " post. insertion

" " " ant. "

Osteology

Ventral formula - C 7 D 15 S & Ca 43 = 65. last caudal

Ribs - 15 pairs.

about the size of
a small hickory
nut.

Chevrons 16 - last very small.

When the vertebral column had been assembled after the bones were cleaned, it measured 5-3 feet 2 inches from atlas to last caudal, in a straight line.

, a.m.

P. H. K. R.

No. 2 See whale ♂ (young adult) Apr. 6/10 Oshima ~~the island~~.

This whale was drawn out upon the cutting ship so my measurements are all accurate & were taken with the greatest care.

Color

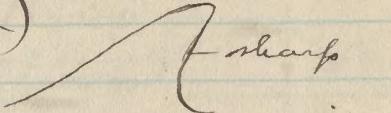
Body

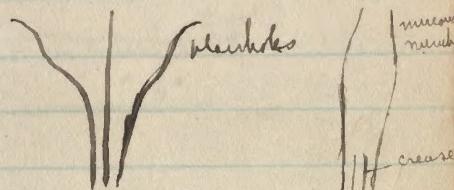
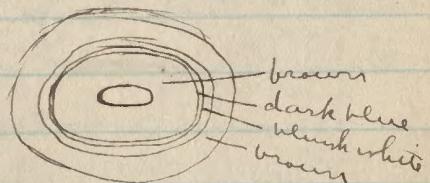
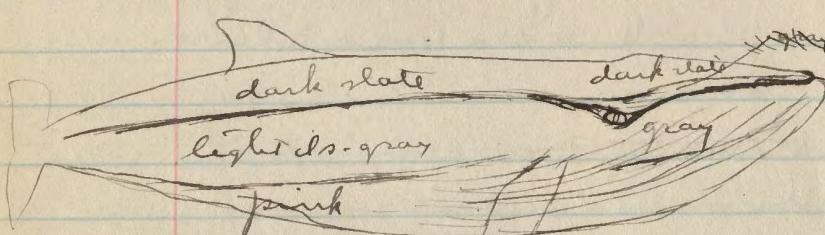
Color described at night by fire light. 2.

The ~~sides~~ top of the head on the right side ~~about~~ about two inches above the eye is dark slate or ~~medium tint~~ - the remainder of the edge of the rostrum is gray. On the left side the dark slate covers the whole of the ~~top of the head~~ ^{to eye} about two inches above the eye it is lighter gray, for a short distance then the dark color begins again and continues along back & upper sides. The edges of the snout for about $\frac{1}{2}$ way on either side are light gray. On the peduncle the dark color covers the upper $\frac{1}{3}$ & comes down to the insertion of the flukes. The left ramus of the mandible is gray - ~~g~~ slate gray runs along the side of throat & breast, but the ramus is lighter than the latter parts. Two of the folds below the left fin are blue ~~gray~~ slate. Throat & breast pinkish-white (deep flesh color) in furrows but folds are white -

On the sides the dark ^{slate} of the back shades off rather abruptly into light Isabeller gray - As in the Finbacks this light gray comes farther & farther down on the sides until, 100 cent. behind arms it covers all but a narrow

ventral line. This ventral line ~~on~~ the belly is light pink
 mucous membrane in mouth is pink -
 Flukes below grayish white above dark -
 Petals above dark
 Dorsal fin is dark slate ~~or ventral like~~
 back - very high (photographed)

Eye Pupil widely elliptical - 
 Iris ^{rich} brown - then comes a very narrow ring of dark blue, then a wider ring of bluish-white, then ring of brown which gradually shades off into white of eye ball



Baleen The greater portion of baleen plates is very dark ^{of dark slate} lead color, but a narrow streak of the inner edge is white - like this

The bristles are all white except at the tips which are grayish - in the anterior $\frac{1}{2}$ of baleen the bristles are all white ^{except at the tips}. The bristles of posterior $\frac{1}{2}$ become grayish at the tips, the gray being of greater extent ~~the~~ on the very back portions.

See description
of baleen
in no. 4 Ser
wall for
more full
& detailed
account.

When I first looked at baleen I thought that the bristles ~~of~~ of all the plates were

H.B. Confused with French bairns
the dark ~~of~~ colored pairin' of the fair whose
is much darker. In fact the color of the
pig is rather nearer to the brownish ochre than the
French.

pure white for about 10 inches up from the base. Proximate & then became tinged with grayish. On closer inspection I discovered that this grayish tinge was due to the ^{dark} lead color of the baleen plates showing through the fringe of bristles, and that the bristles themselves were not grayish except on the tips of the posterior one half. The pure white strip along the inner base of the baleen plates give the appearance of a white band ^{about 10 inches wide} ~~along the inner base of the~~
~~both sides of the baleen~~. Both sides of the baleen
The baleen of both sides was alike.

The folds end 100 cent. anterior to the umbilicus. N.B. (Umbilicus not located correctly)

Osteology

<u>Right scapula</u>	cent	<u>Left scapula</u>	cent
Greater height (vertical)	= 40	Ditto	= 41
" breadth	= 66.5"	Ditto	= 66
Length coracoid	= 10 6.5"	Ditto	= 16
" acromion	= 6 1.5"	Ditto	= 7.5"

Both scapulae photographed & saved.

Both scapulae photographed & saved.

Left rami of mandible

Length straight = 226
" curved = 230

Tips to coronoid straight = 189

Height of " vertical = 4.5.
(coronoid cut a little)

The left pectoral fin was saved and I dissected it with great care, cutting away the cartilage from the minute phalanges at the tips of the digits. I am absolutely certain that the formula below is correct.

Left pectoral

II III IV I (I took as the 2nd digit the outside)
 4 6 5 2 (one on the radius. of the 2nd digit, the 3rd with
~~the 4th & 5th~~
~~the 2nd & 3rd~~)

There were five carpal ossifications in this fin - 3 in the proximal row were about ~~the~~ one inch & one half in diameter & were placed in a parallel line with the ends of the radius & ulna. The two carpalae in the distal row were small. The right fin presented the same number & position of the ossifications.

Left fin

ext.

Length of radius (median straight) = 46.5-

Breadth " " (distally ") = 10.5-

Length " ulna (median ") = 45.3

Breadth " " (distally ") = 9.3

Depth olecranon " " = 6

Length of humerus (median ") = 27

There were either 12 or 13 ribs. I could not be sure which, but I think 13 pairs. (N.B. In no 4 sci where I find 13 prs of ribs + this is probably the normal number.)

(measurements see page 14)

Measurements of Sperm whale no. 2

cont. 2/1

1	Total length snout to notch	= 1007
3	Snout to eye	= 190.
4	" " ear	= 253
5	" " blowhole (center)	= 151.81
6	" " post. nostr. pectoral	= 380 } OT
7	" " " " dorsal	= 731.0 } OT
8	Eye to ear (center)	= 60
9	" above "	= 10
10	Length opening of eye	= 7
16	Notch of flukes to post. insert. dorsal.	= 290
17	" " " " " " pectoral.	= 670
18	Length pectoral (tip to head of humerus)	= 142
19	" " " " post. insertion	= 90.
20	" " " " ant. "	= 121
21	Greatest breadth of pectoral	= 27
22	Height of dorsal (vertically)	= 32
23	Flukes tip to tip.	= 245.
25	Depth notch of flukes	= 15.
27	Length left lobe axially.	= 182
32	" blowhole straight	= 27
33	Dist. apart " anteriorly	= 2.51
33	" " " posteriorly	= 16
37	Anterior to naval	180
39	Dist between male mammae	= 9
41	Longest plate of baleen (inside)	= 581
42	Number .. .	= 293
44	" of ^{baleen} baleen furrows (betw. fins)	= 42
	Out-post. length dorsal	= 451

skeleton taken

18.

No. 3 Killer (Orcinus orca) ♀ Apr. 8/10 Oshima ~~Shikoku~~ Id.

I was given time to photograph & measure carefully this specimen and also to compare it with the figure given by True in his "Delphinidae" a copy of which I had with me. His figure is excellent and could hardly be improved upon - only a few ^{very} unimportant details ~~as~~ I noted, which the specimen differed from the figure.

Color

Body

General color black - by pulling off one layer of the epidermis the color below was seen to be very dark neutral tint which is probably the color in life. An elliptical white spot running fore & aft on each side of head. The anterior point of this spot ~~is~~ about ~~two~~ four cent. ~~beyond~~ beyond eye and about five cent. above it; the length (longitudinal) of this spot was 60 cent. - the greatest breadth was 17 cent. On the sides of the back, opposite the posterior insertion of the dorsal fin was a roughly crescent-shaped patch of purple. This was ~~very~~ indistinct, and its edges were not well defined. It was of same shape, size & position as the white patch shown in True's figure. ~~Its~~ Chin, throat & breast to pectorals white. White extends from corner of mouth backward and downward to about 7 or 8 cent. beyond anteroinsertion of fin. The white extends considerably above a line drawn from corner of mouth to

anterior margin of fin. Just at corner of mouth the black projects into the white in a small semi-circle. The white runs down between pectorals below & extends backward along the median ventral line. The white does not come up close under the fins ~~at first~~
~~a short & narrow~~. The white area is broad between the fins narrowing as it goes backward until at its narrowest point it is 20 cent. wide. It then curves abruptly upward & backward along the sides of the peduncle. At the point where it curves backward on the sides the white band is 56 cent wide. On the central line of the trident runs backward to a little behind vent. above the genitalia the white is 44 cent wide; the black above the genitalia is 25 cent. wide. On the sides of the peduncle the white ends 120 cent. from insertion of flukes (anterior). In the central white line ~~at first~~ between two circles in front of the maxillae is a black patch.

The inward curve of the white area on the sides, begins 288 cent. from anterior insertion of fin, and ends 120 cent. from insertion of flukes (anterior).

Flukes Above black. Below white except for a black band 2 inches wide which runs along the posterior margin across the

Obo Druga mare
 Daisan Hoge mare
 Iwazuma mare
 Daichi

tips & on the anterior edges for about ten inches from the tips, where it runs off & is lost. The white of the lower surface extends ~~tore~~ forward & in a triangular patch on the inferior edge of the peduncle about 8 or 9 inches ~~up~~ anterior to the insertion of the flukes.

The anterior edge of the flukes was almost straight except near the tips where it curved to meet the posterior edge. The posterior edge was slightly concave near the tips, then curved very gradually anteriorward ~~to the~~ until it turned rather abruptly inward to form the notch. The median ventral ridge of the peduncle is low ^{& rounded} on the inferior surface, & loses itself about four inches from the bottom of the notch.

Pygopophyse
 On the superior surface of the flukes the dorsal median ridge of the peduncle is more prominent than below and extends nearly to the notch.

Pectoral fins

Black above & below -

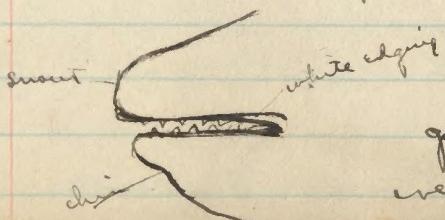
Dorsal
fin

Black - Anterior edge slightly convex toward tip - posterior edge - concave forming a shallow crescent. The fin is better described as being erect and not deeply falcate.

Head ^{Top view} From the pectoral fins to the eye it narrows gradually, but in front of the eye the two sides slope more abruptly to the snout which is "roundly truncated". A photograph taken after the head had been severed from the body, shows that it is not quite bilaterally symmetrical.

Side view A few inches from the tip of the mandible there is a pronounced dip in the outline of the throat. The snout projects $\frac{1}{2}$ cent. beyond the lower jaw. It rises abruptly & then slopes gradually upward & backward to the blowhole.

From the corner of the mouth, there is a white edging to the upper lip. This white band is about one inch wide at the corner of the mouth gradually narrowing as it runs forward until it runs off & is lost before it quite reaches the middle of the lip. Hairs



I examined the snout, lower jaw & head with the greatest care to see if any hairs were present - none whatever.

could I find, nor were there any evidences of chin ~~process~~ having been any.

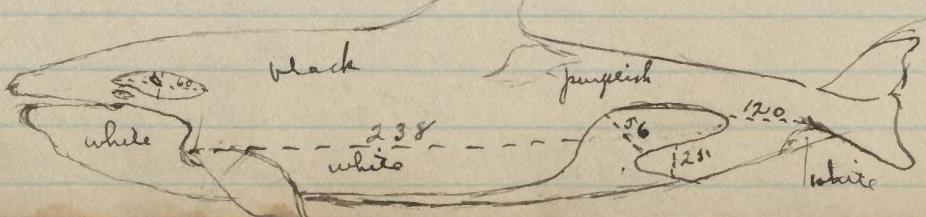
Corrections of figure published by Prus "Delphinidae"

The dip in the chin is more abrupt & pronounced than is shown in the figure. The upper edge of the white spot above eye is more curved than shown in figure - that is the spot is more nearly regularly elliptical. The white of the throat runs down closer ^{superior} to base of pectoral and ends in a curve instead of an angle as shown in figure. The superior edge of the white mark on the peduncle is more convex (not so flat) than in figure. There is too much dip in the superior outline of the peduncle, in the figure - this is nearly straight. No white edging is shown on the proximal half of the upper lip as figured.

[These are all probably only individual differences & have but little importance]

Blowhole

It is ^{an} irregularly semicircular slit the convex border pointing forward. The blowhole is situated in a ~~slight~~ depression in the top of the head. Length curved = 16 cent. Length from tip to tip of points (straight) = 12 cent.



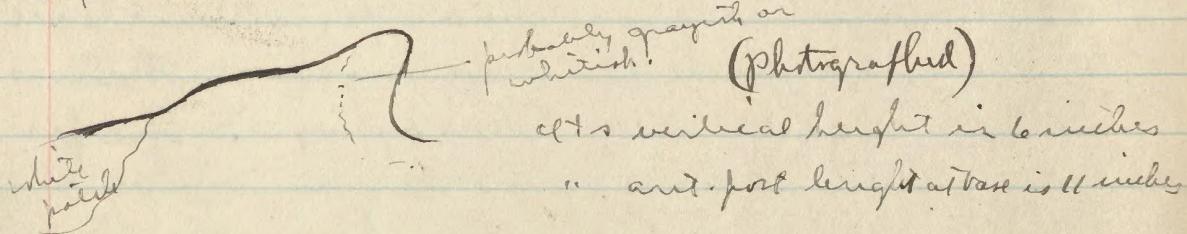
eye

The eye is situated 11 cent. above the corner of the mouth and 10 cent. behind it. The opening is 4 cent. in length & is elliptical. There are no creases either above or below eye.

tongue

The tongue was yellowish white & 50 cent. long by 21 cent. greatest breadth.

The stomach contained the dorsal fin & part of the skin immediately in front of it, of a porpoise. The fin is shaped like this.



Blubber on back of Killen thinnest just above pectoral in median line - here it is 5.5 cent. thick - as it goes backward the thickness increases until on peduncle just above genitalia in mid dorsal line it is 17 cent. thick. (This is not the thickest place)

83	Measurements of Killy (Orca area)	cent.
1	Total length (snout to flukes over back)	= 670
2	Semi-cir. of body just behind first fin from mid dorsal line to mid ventral line	= 220*
3	Snout to eye	= 74
4	" " ear	= 103
5	" " blowhole (center)	= 88
6	" " post. insertion of pectoral	= 168
7	" " " " " dorsal	= 331
8	Dist. from eye to ear (center)	= 35
9	Ear below eye	= 7.51
10	Length opening of eye	= 4
11	" " " " ear	= .2
12	Notch of flukes to anus	= 200
13	" " " " clitoris	= 230
14	" " " " mammary slit	= 224
15	" " " " umbilicus	= 393
16	" " " " post. insertion of dorsal	= 340
17	" " " " " " pectoral	= 520
18	Length pectoral, tip to head of humerus	=
19	" " " " post. insertion	= 78
20	" " " " ant.	= 100
21	Greatest breadth of pectoral	= 59
22	Height dorsal (vertical)	= 70
23	Flukes tip to tip	= 1951
24	Greatest breadth flukes (ant.-post.)	= 59
25	Depth notch of flukes	= 11
26	Length right lobe " " (axially)	= 101
27	" left " " "	= 104

* The whale had been lying about 17 hours & was considerably swelled by gas - no air had been pumped in whale

28	Greatest thickness of flukes at insertion	=
29	Depth of peduncle at ant. mid. of flukes	= 3.2
30	" " midway between insertion of flukes & anus.	= 8.5 -
	Length of blowlake (straight)	= 12
	" " " (curved)	= 16
35	Length of anus	= 6
36	" of genital slit	= 4.3
38	Length " mammary slit	= 12
39	Dist. between mammae	= 27
43	Mpus jaw extends beyond lower height of dorsal (axially)	= 2.5 -
	Ant. post. breadth dorsal at base	= 6.0
	Corner of mouth to tip of snout	= 6.6
	Dist. between ant. insert. of pectorals ^{below}	= 8.0
	" " post. " " " " = 9.0	
	ant. post. breadth pectoral fin at insertion	= 3.7

Osteology

Rib 11 prs.

Five ribs joining sternum

Skeleton taken 8 P.M.

No. 4

Sei whale of Apr. 13 / 10 Oshima

This whale was pulled out upon the slip & my measurements were carefully taken so they can be relied upon fully.

for

Color? described at right

Pearl's
position

~~Left side top of head is dark slate except for a band (along edge of snout) in front of eye forward about three feet long and one foot wide; this band is a little lighter in color than rest. Right side top of head is dark slate like left side except for a broad area of lighter slate which runs from eye nearly up to blowholes & then diagonally forward & downward to ^{half way to} end of snout; therefore the greater part of this side is of the lighter slate color. Back & the superior one third of sides are dark slate as top of head - rest lower two thirds of sides light gray - at navel the gray of the sides comes down & runs across belly in a band about 3 ft. wide - the navel is situated in the center of this band. The dark slate of the back & upper sides comes down to the insertion of the flukes - From the tip of the under jaw the throat & breast are white; ^{The furrows are pinkish} 17 folds on the breast are white. ^{is only in the furrows &} The pinkish color does not extend up to fins underneath; ~~and~~ under the right fin 11 folds are dark gray - about the same number under the left fin although I did not~~

count the exact number - Directly under the corner of the mouth on left side 20 folds are dark gray - ~~From~~ the end of the creases or furrows to the flukes the gray comes down nearly to the ventral line, which is pinkish. ~~As~~ ~~the~~ ~~pinkish~~ The pinkish ventral area narrows gradually from the genitalia backward until it becomes a very narrow line. On

Left ramus of mandible has lower one half light gray - upper $\frac{1}{2}$ slate or dark gray. The edges of the snout for 12 inches on either side are light gray -

Flukes

Under surface of flukes light gray - about same color as sides of peduncle - caused by very fine lines - the posterior edges are dark slate as are tips and the anterior edge for a few inches from tips. Above flukes are slate.

Pectorals

Right (Photographed) The superior surface has the anterior edge light gray, caused by the light color ~~of~~ below running up over the edge onto the superior surface for about 2 inches for its whole length. The remainder of the fin is blue-slate becoming darker slate ~~to~~ near posterior edge. Below, the anterior half of the fin for its whole distance is light gray.

the posterior one half is slate, except near the proximal end where the slate changes to dark gray.

Baleen There are 315 plates of baleen on the left side covering all plates two inches or more in height.

The first 207 plates of baleen have more or less white along the inner edges; this white is in longitudinal streaks & decreases gradually toward the posterior part of the baleen row - the remainder of the plates are all very dark ~~blueish black~~ - much darker than the Finback baleen. Along the inner base of the baleen row for whole length is a line of plates from two to three inches high & one half inch wide. These are white & with their white bristles make a band about five inches high along inner base of baleen row. The bristles of the anterior fourth of the baleen row ~~are~~ are all white - the second fourth have the tips tinged with grayish for about four inches, the third fourth have about eight inches of tips grayish & the bristles of the last fourth are almost all grayish & except for the white base line. When one first looks at the baleen of the sei whale he baleen gets quite a different impression than

that obtained by a careful examination.
This description was written at my leisure ~~at~~ while examining carefully the baleen of this whale. ^{For} ~~The~~ the description of baleen of whale no. 2 one should refer to this. The baleen of that whale was as nearly like this specimen as possible.

External Characters The distance between the tips of baleen
the two rows of baleen at the widest point was 85 cent. (as they were setting in position.) The superior edge of the peduncle does not ascend to the flukes quite so abruptly as it does in the Blue whale. At the ant. insertion of the flukes the peduncle is 42 cent. wide & 78 cent. deep.  The folds are about 3 cent. wide on breast - are narrower on throat & wider where they end.

~~These~~ measurements of the fin were taken (ant. + post inserions) before the peduncle was cut off & while it was extended at right angles from the body.

Rib 14 pairs - the last pair being rudimentary first ribs on both sides have bifurcated heads (skeleton taken so full description can be written later)

20.7

Measurements of no. 4

1	Total length	= 135.0
3	Tip of snout to eye	= 280
5	" " " blowhole	= 220
6	" " " post insertion of pectoral	= 465.
10	Length opening of eye	= 8
14	Notch of flukes to mammary slit	= 385-
17	" " " post insertion of pectoral	= 890
18	Length pectoral - (tip to head of humerus)	= 187
19	" " (,, " post. insertion)	= 152
20	" " " ant. "	= 165.
21	Greatest breadth of pectoral	= 40
24	" " " flukes ant-post.	= 90
26	Length right lobe axially	= 170
28	Greatest thickness of flukes at insertion	= 17
29	Depth peduncle at ant. most. of flukes	= 78
37	Anus to navel	= 400
39	Dist. between mammae	= 12
40	Length row of baleen (straight)	= 275-
41	" longer plate of baleen (screws)	= 70
42	Number of plates of baleen	= 315-
44	Number of breast furrows between fins	= 32

10 P.M.

No. 5. Sea whale of Apr. 13 / 10 Oshima

Color

Body

Top of head, left side, dark slate - the upper edges of the snout for a short distance from the end on either side are grayish - underneath this changes to pinkish which extends ~~backward~~ for 135 cent. from tip of snout

Left ramus of mandible has upper $\frac{2}{3}$ light slate & lower $\frac{1}{3}$ pale lavender gray

Right ramus is light gray for the whole distance - in front of ~~the~~ dorsal fin to head the back and upper sides are dark slate - behind dorsal

the upper $\frac{1}{3}$ of the peduncle is dark slate like back the sides of peduncle ^{from fin backward} are ~~alternating~~ many dark & light

~~small~~ small areas - the light areas cease to be composed of fine wavy lines as "graining" I also a great many small white scars.

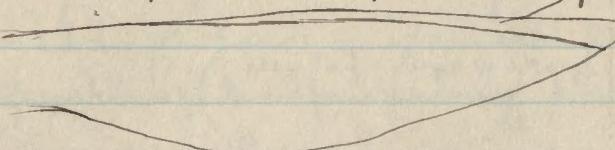
On breast between fins are 22 white folds - furrows are pinkish - there are 9 dark folds under right fin.

Pectorals

The pink area ~~to~~ (ventral) becomes narrower as it goes backward until when it reaches peduncle it is very narrow - same as in the other whales I have described.

Peduncle Above slate except anterior edge which

is light for almost whole distance
but the light is very narrow toward
proximally end. Under surface
of both fins is very light gray
superior surface fins finely lined with grayish
almost white.



Baleen Bunches of 1st one fifth of baleen raw all
white - 2nd ~~and~~ fifth has tips grayish -
in 3rd fifth tips grayish for about 8
or 10 inches - in 4th fifth grayish
for half their length from tips down-
ward - last fifth all grayish.

For 30 cent. from tip of baleen raw are
either side plates all white.

Eye Length of pupil = 15 mil

Dia. " " = 11 "

Length of iris = 38 "

Dia. " " = 25 "

Cir. of eyeball (trimmed) = 310 mil.

Pupil elliptical - then comes iris of
dark brown (much darker than
in Finback) which is 12 mil wide - then
just a suggestion of a bluish-white ring
or edging to the next wide ring which
is almost black & runs off into
the gray of the eyeball; this blackish
ring is 1.9 mil. wide - eyeball is elliptical

These measurements were taken from the eye before it was put in alcohol. It was carefully compared with the eye of a Finback taken the next day. The eyeball is much more elliptical than is that of the Finback.

Dorsal

Very high & ^{reared-fine} (photographed). By peeling off portions of the epidermis I found the color to be gray slate, with little if any blue ^(red) in it. This is probably the true life color of the back & head also. The Finback dorsal was neutral tint, with ~~a~~ a good deal of blue? mixed with black & white would get it. It was decidedly purplish which is probably life color & is what I have described the Alaska Finbacks to be.

Measurements of Sperm Whale (taken in sections)

1	Total length (sum of 3 sections)	= 1460
3	Snout to eye straight.	= 287
10	Eye opening.	= 7
14	Notch of flukes to mammary slit.	= 425
16	" " post. base dorsal	= 445
18	Length pectoral tip to head of humerus	= 193
19	" " " post nostril	= 135?
20	" " " ant. ..	= 170
21	Breadth pectoral	= 37
22	Height dorsal (vertical)	= 44

19.6 SW - May

	Height of dorsal (axially)	= 65-
	Length (ant.-post. at base)	= 80
23	Flukes up to tip	= 355.
27	Length left lobe axially	= 195.
29	Depth pedunculi at ant. insert of flukes = 85-	
30	" " between flukes & anus = 135 -	
38	Length of mammary slit	= 18
39	Dist. between mammae	= 18
40	Length baleen row	= 285-
41	" longest baleen plate (inside)	= 73
44	number throat furrows	= 40

2 P.M.

No. 6 Finback ♂ Apr. 14 / 10 Oshima
 This whale was brought in about 2 P.M. so I was able to get a few photographs. The "total length" is the total of three sections.

ColorBody

Upper sides & back neutral tint (seen by pulling off the upper epidermal layer) - the ridge of back ^{on} peduncle neutral, the rest of the upper sides & sides isabelline gray (the neutral tint of the back extends down from the median line only about 12 inches on either side) Left ramus dark slate - Right ramus has the anterior half all whitish shading into light gray of the posterior half. As in the Alaska Finbacks the gray of the sides comes farther & farther down toward the mid ventral line as it goes backward until about 3 ft in front of the flukes only the very ventral ridge of the peduncle is white - a little way behind the gills the ventral white strip is 15 inches wide. The throat, breast & belly are white, (folds) with dark furrows, as in ~~Alaska~~ Finbacks. Under right fin 3 folds are gray

Pectorals

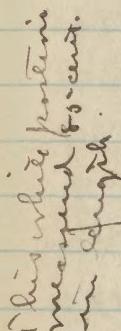
The tips of both fins have been injured - I photographed both inferior & superior surface.

Under side (Right) has ant. $\frac{2}{3}$ whitish gray shading running over post. $\frac{1}{3}$ from

edge. Above ant. edge whitish for whole length - rest of upper surface gray. Both fins are the same. On under side left fin two ^{deep} fresh scars, cup shaped, evidently where parasites had been lodged.

Balena

I counted all baleen plates on left side from very back plate 2 inches high, to front plate 2 inches high - there were 332 in all on this side.



On the right side (anterior) ~~28~~ plates are white - the edge of the mouth underneath is whitish for the length of the white portion of baleen.

Anterior two thirds of baleen plates have bristles light grayish at tips - (very front ones are not so, but are white) posterior $\frac{1}{3}$ have bristles all grayish, darker at tips.

Eye

Pupil nearly round - iris very widely elliptical - iris of brownish - iris is 12 mil. wide - then a white ring 4 mil. wide - then brown ring 10 mil wide which runs off into gray of eyeball. Eyeball is very widely elliptical - almost round.

Length of pupil - - - 3 mil.

Dia " " - - - 17 "

Length " iris - - - 45 "

Dia " " - - - 30 "

Cir. of eyeball (trimmed) - - 375 "

21.5

© Stenopterygia
skull

These measurements were taken when the skull had been cleaned & are correct.

Length (straight) from tip of premax. to condyles (taken below) = 477 cent.

Breadth (squamosal) = 180 "

Length of jaw (straight) = 450 "
" " " (curved) = 485 "

Measurements of finback no. 6

1	Total length (total of three sections)	= 18651
3	Snout to eye	= 401
5	" " blowhole (center)	= 347
10	Length eye opening	= 9
12	Notch of flukes to anus	= 510
16	" " " post. inst. of dorsal	= 4751
18	Length of pectoral (tip to head humerus)	= 230
19	" " " " post. inst.	= 1451
20	" " " " ant. "	= 1951
21	Greatest breadth pectoral	= 60
22	Height dorsal (vertical)	= 43
2	" " (axial)	= 751
	Ant-post length dorsal at base	= 85
31	Length right blowhole straight	= 44
32	" left "	= 41
33	Dist. apart. " (anteroally)	= 5-
34	" " " posteriorly	= 25
40	Length row of baleen	= 400
41	" longest plate of baleen	= 80
42	Number plates, " " (left side)	= 332
43	" " " in white part	= 98

Greatest height dorsal = 1390

10 pm.

No. 7 Blue Whale ♂ April 14/10 Oshima

The length of this whale was the total of three sections.

Color

Body

The top of the head is almost as light gray as are the markings - it is solid color - a whale's head is darker - the light & markings extend (on left side) forward to the eye ending there in very small patches - On the left side of the body as far as the end of the fin the light color is almost solid, broken in only a few places by the darker ground color. On the sides of the peduncle from the fin backward to the flukes the light & dark colors are about equal in quantity - the light color is in small patches - just forward of flukes there is more dark than light - Along the ridge of the back from fins to flukes

the ~~light~~ dark color predominates - but there are also many rather small light markings - On the sides the light markings follow downward along the ends of the furrows closely but do not run over on to the folds - just above the left fin the light color is almost solid - The light gray markings which follow the ends of the folds

① osteology
skull

These measurements were taken when the skull had been cleaned & are correct.

Length (straight) (from tip of premax. to condyles taken below) = 477 cent.

Breadth (squamosal) = 180 "

Length of jaw (straight) = 450 "

" " " (curved) = 485. "

Measurements of Finback No. 6

1	Total length (total of three sections)	= 18651
3	Snout to eye	= 401
5	" " blowhole (center)	= 347
10	Length eye opening	= 9
12	Notch of flukes to anus	= 570
16	" " " post. inst. of dorsal	= 4751
18	Length of pectoral (tip to head humerus)	= 230
19	" " " " post. inst.	= 1451
20	" " " " ant. "	= 1951
21	Greatest breadth pectoral	= 60
22	Height dorsal (vertical)	= 43
2	" " (axial)	= 751
	Ant-post length dorsal at base	= 85
31	Length right blowhole straight	= 44
32	" left "	= 41
33	Dist. apart. of (anteriad)	= 5
34	" " " posteriorly	= 25
40	Length row of baleen	= 400
41	" longest plate of baleen	= 80
42	Number plates " " (left side)	= 332
43	" " " in white part	= 98

Greatest breadth dorsal = 1390

10 pm.

No. 7

Blue whale ♂ April 14/10 Oshima

The length of this whale was the total of three sections.

ColorBody

The top of the head is almost as light gray as are the markings. It is solid color - at blowholes it is darker - the light & markings extend (on left side) forward to the eye ending there in very small patches - On the left side of the body as far as the end of the fin the light color is almost solid, broken merely a few places by the darker ground color. On the sides of the peduncle from the fin backward to the flukes the light & dark colors are about equal in quantity - the light color is in small patches - just forward of flukes there is more dark than light - Along the ridge of the back from fins to flukes the ~~light~~ dark color predominates - but there are also many rather small light markings - On the sides the light markings follow downward along the ends of the furrows closely but do not run over one to the folds - just above the left fin the light color is almost solid - The light gray markings which follow the ends of the folds

meet at the genitalia but from navel to genitalia an mid-ventral line they do not meet & this is plain - from the genitalia backward to flukes on the ventral line the light & dark markings are about equal.

There is a patch of dark about five feet long & two feet wide (irregular) from the posterior insertion of dorsal forward on the left side

Right ramus of mandible is gray lighter than the top of the head (which is the same color as the dark of the body) On throat (median) are a few small ash colored markings,

On the folds white markings come down from root of each fin diagonally backward & downward directed toward navel (but only a few scattered ones reach navel)

There are only a very few small scattered white markings on very mid-ventral line forward of navel -

There are a few ashy markings on breast between fins but no white ones - No white patch below fins -

Dorsal is lined as usual - the ant-edge is very light - almost white -

Dorsal

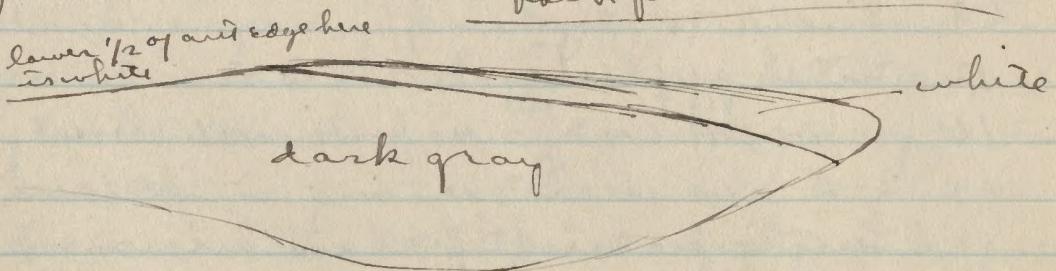
Flukes

Above considerably darker gray than sides of body. Below are gray (darker than no. 1) gray for whole surface except a narrow posterior edging to the tips which are dark -

*depth of
width of
narrower.*

Pectorals. Above dark gray except tips and the ant. $\frac{1}{3}$ off ~~post.~~ ant. edge. - these parts are white - below white.

both fins same



External notes A fresh parasite scar at ant. end of blow holes, shaped like this:  This ~~one~~ elliptical cup is about one inch deep and contains a lining which may be pulled out, leaving the fat blubber exposed. Capt. Nelson tells me that it is a "shellless barnacle" which fastens here. Evidently the parasite lets go & frees itself when the whale is killed. It could not be a barnacle like those on the Hump-back (Coromula) for this fellow could not let go. Also the scars are nothing like those left by Coromula.

Between fins one fold is 6.5 cm. wide.
These same scars were found on
both the sei whale & Finback.

<u>Osteology</u>	Length of skull (straight) from tip of premax. to condyles below	= 590
	Breadth squamosal	= 250
	Length jaw straight	= 560
	" " curved	= 600

Measurements

1	Total length (taken in sections)	= 22751
3	Snout to eye	= 506
12	Notch of flukes & gapes	= 625(?)
16	" " " post. next. dorsal	= 5151
17	" " " " pectoral	= 1440 (544)
18	Length pectoral (tip to head fulcrum)	= 3651
19	" " " " post. next.	= 2551
20	" " " " ant. "	= 3251
21	Greatest breadth pectoral	= 90
23	Flukes tip to tip	= -
24	Greatest breadth flukes (ant-post)	= 130
25	Depth notch	= 20
26	Length right lobe axially	= 2751
30	Depth peduncle between flukes gapes	= 215-

10 P.M.

39

no. 8 Blue whale ♂ Apr 15/10 Oshima

Total length of this whale was taken straight.

ColorBody

Top of head left side is mostly or rather light gray (but not as light as body markings) From opposite the genitalia the sides of the peduncle back to the flukes is mostly small light gray markings - also here there are many scattered white dashes & markings - On ventral surface just above the genitalia for about one foot on either side the darker gray predominates and backward to midway between flukes & ^{the} anus darker gray peduncles - from there on to flukes the ventral line is light gray like ~~the~~ sides of peduncles. Between the navel & anus on ventral line the darker gray is found. From the dorsal fin to flukes the light gray markings run over mid dorsal line. The light gray markings of the upper sides run close down to base of fin above, and down on to six of the folds between corner of mouth and anterior insertion of fin. The light gray markings below the ends of the furrows but do not come so close to ends as in no. 7 Blue whale.

On belly folds from a short distance behind fins there are many small ash colored markings - also a few scattered white ones. Six folds under left fin are whitish - an irregular line 3 ft long of white dashes comes obliquely downward & backward from posterior insertion of fin. There is then a break of 18 inches in the white line of dashes and then it begins again reaching nearly to median line, half way between fins & navel. These white dashes are about 2" in. long & 3" in wide. ~~On~~ Five folds directly under right ~~left~~ fin are whitish (but not the furrow) On breast between fins are a few ash colored markings.

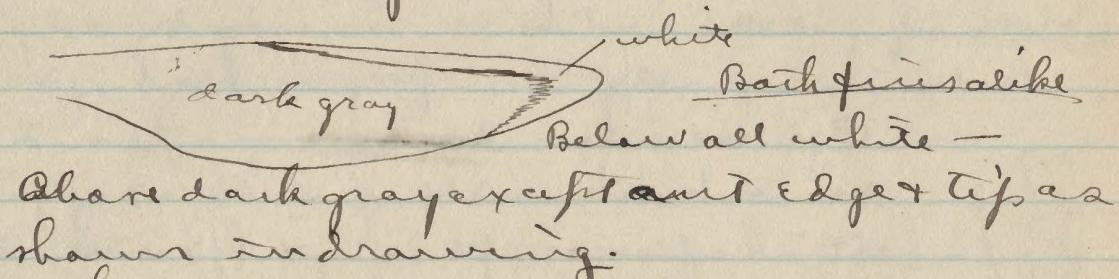
On upper sides & back directly ~~between~~ above navel is a large patch of almost solid light gray markings - the navel is white. The right ramus of the mandible is of a lighter gray than are folds of the throat.

Dorsal Laterally
Photographed Anterior edge very light gray shading into the gray color of the body markings - Very light gray lines start from ant. edge & run downward over sides as in

all the other Blue Whales - tip & posterior edge is dark gray - post. edge has been injured.

Pictorial

Photographed



External Characters

The peduncle is covered with small scars & "blisters" which give it a crumpled appearance.

Male mammae situated on either side of ventral line 30 cent. behind penis base.

Measurements of No 8

1	Total length - (taken straight along side)	= 2205-
3	Snout to eye	= 512
12	Notch of flukes to anus	= 587
13	" " " penis (center)	= 717
15	" " " navel	= 927(?)
16	" " " post. vent. dorsal	= 507
17	" " " " pectoral <small>taken straight</small>	= 1400
18	Length pectoral (tip to head binnervae)	= 317
19	" " " post. vist.	= 226
21	Breadth pectoral	= 87
22	Height of dorsal (vertical)	= 31
35	Length anal opening	= 16
38	" mammary slit (male)	= 28
39	Dist. binnervae "	= 20
40	Length row of baleen "	= 480
41	" longest " plate	= 120

2 a.m.

No. 9 - Finback - ♂ - May 20 - Aikawa

This whale was drawn out upon the slip so that measurements are all correct.

ColorBody

I did not have an opportunity to observe carefully the top of the head.

On the side a ~~dark~~ gray band comes down backward from root of fin below; it is about 2 ft. long & 1 ft. wide. The second band which is dark gray (much darker than first) is the same size & runs down & back at same angle & begins opposite end of fin and back.

On throat the central area has bottoms of furrows pinkish & sides of throat has them dark. The same condition extends for whole length backward except on belly about opposite tip of fin laid back where all furrows are dark except very median ventral ones.

Right side runs very light gray (almost white) especially toward the tip. Between the corner of mouth and right fin the grayish of the lower back runs down onto folds about $2\frac{1}{2}$ ft - at corner of mouth a very dark band runs backward not quite reaching fin insertion - On the throat between the corners of the mouth 16 furrows are pinkish & the rest are dark.

The first dark band extends on 12 or 13 folds - the 2nd band on 5 or 6 more folds, but bands are same angle.

The inside of the right ramus is dark slate
inside " " left .. light gray.

Dorsal Left fin injured at tip - below white
except grayish at base, along post.
edge and at tip. White runs over on
to superior surface along anterior
edge - Rest of above is slate.

Flukes Below base posterior edge, anterior edges
& tips dark gray - rest all white - post-
erior edging is darker than anterior,
above dark slate. Notch overlaps

$\frac{7}{25}$

Dorsal Dark slate - dorsal is high recessed
& has a deep notch in post. edge at base.

Baleen Bristles of baleen ^{almost} all tinged with gray-
ish - the only pure white ones being the
very anterior plates - going backward
the bristles become more strongly gray
and especially so at tips

(For measurements see
opposite page)

21st

measurements Finback No. 9

1	Total length	= 184.51
3	Snout to eye	= 400
6	" " post. vent. pectoral	= 630
8	Eye to ear (center)	= 84
12	Notch of flukes to anus	= 573
16	" " " post. vent. dorsal	= 425
17	" " " " " pectoral	= 1240
18	Pectoral tip to head of barnacles	= 224
19	" " " post. vent. "	= 1451
21	Greatest breadth pectoral	= 5.3
22	Height dorsal (vertical)	= 3.9
23	Flukes, tip to tip	= 4.151
24	Greatest breadth flukes ant. post.	= 1.05
25	Depth notch	= 2.51
26	Length right lobe axially	= 219
27	" left "	= 219
29	Depth peduncle at ant. vent. of fluke	= 85-
30	" " midway between " " " and anus	= 15.8
36	Anus to base of penis	= 135-
37	" " umbilicus	= 3.61
44	Number of throat furrows	= 74

Greatest breadth = 142.8
Greatest height = 14.25

109.m.

no. 10 Finback ♀ May 20 / 10 Aikawa

This whale contained a male foetus about 18 inches long; it is preserved in alcohol.

Color

Left ramus dark gray - right ramus light gray - inside left ramus light gray - inside right ramus dark gray.

Pectoral

Below ~~has~~ distal $\frac{1}{3}$ all gray except ant edge - middle $\frac{1}{3}$ has anterior half white & post. half gray - the proximal third is the same

Dorsal

All slate. This fin is unlike any I have seen before it is long & narrow not having the broad base of others - it is roughly finger shape ~~gradually~~^{gradually} spreading but comparatively entire at the base.

Bilobes of anterior $\frac{1}{3}$ are white; of middle $\frac{1}{3}$ have gray tips - last $\frac{1}{3}$ all gray.

Two creases run out of corner of mouth - center of eye 20 cent. above corner of mouth.

Measurements over page.

72"

Measurements of Fimbock No. 10

1	Total length	= 1980
3	Eye to snout	= 440
5 blowhole (center)	= 377
8 ear (ear not certainly located)	= 68 (?)
9	.. above "	= 13
10	" opening	= 10
18	Pectoral tips to head of baleen	= 243
19	" " post. insertion	= 160
21	" greatest breadth	= 60
40	Length of baleen row (straight)	= 435-
42	" .. longest plate of baleen	= 86

P.M.
2

no. 11 Finback ♂ May 22/10 Aikawa

Color Left side of head darker than right - it is dark neutral tint - right side gray slate, the light color extending behind eye & front of eye half way to tip of snout - Inside left ramus light gray for lower half - upper half slate - right ramus inside all slate. Left outside is ^{dark} slate - right outside is very light.

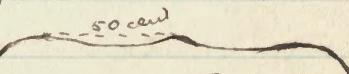
Pectorals Below - a grayish band eight inches wide runs along posterior edge - at tip all except a narrow anterior edging is grayish - Rest of under part of fin is white - Above all slate - white not running over and upper surface along the anterior edge as is usual. Tips of both fins have been injured.

Head On the left side 180 cent. from tips, and 35 cent. from edge of snout is a large scar evidently made by a harpoon. The scar is in the form of an irregular opening 28 cent. long which runs almost straight downward thru' the rostrum. The inside of the scar is covered with black skin. On the lower side it opens in the midst of the baleen & here the baleen has grown together

into three heavy bunches which are white & set loosely in the skin. On the inside of the flipper arms are many small scattered scars such as would be produced by the bursting of a harpoon bomb.

I had an opportunity to examine carefully the head of this whale & as it was typical will describe its shape in detail.

A cross section of the head directly in front of the blowholes would be this



The median ridge, which is highest immediately in front of the blowholes runs forward, becoming lower & less pronounced until it is lost entirely 105 cent. from the tip of the snout. Opposite to the anterior ends of the blowholes ^{on either side} to 50 cent. from the median ridge, a long, broad, bump-like ridge begins which runs forward along the edges of the rostrum to the tip. At its summit it is rounded. As the central ridge is lost 105 cent. from the end of the rostrum and as the two side ridges persist to the extreme tip,

therefore the distal portion of the rostrum is concave. ~~at the begin~~ For the entire length of the median ridge the spaces between it & the side ridges present shallow concavities or troughs.

Hairs

There were a few scattered hairs about blowholes, and along both edges of the rostrum; there were none on the very median line. On the mandibular synphysis the arrangement of the hairs is the same as in the Alaska Finbacks viz. Two irregular lines on either side of the low median ridge, & two other shorter & more irregular lines outside of these. Other hairs are scattered about in no definite arrangement.

Rostrum

I measured the rostrum by sections before the blubber had been stripped from the edges.

86 cent. from tip rostrum is 80 cent. wide.

125	"	"	"	"	"	95	"	"
175	"	"	"	"	"	106	"	"
285	"	"	"	"	"	145	"	"
330	"	"	"	"	"	205	"	"

is across the eyes.

Three folds run out of corner of mouth and four furrows

50 Ribs

I could not be certain but I believe there were 16 pairs of ribs.

20.0

One fin-ray is 45 cent. long, next is 60 cent. next 75 cent. next 90 cent.

Eye

The posterior corner of the eye is directly above the inside corner of the mouth. The pupil of eye is 3 cent. in front of corner of mouth & 16 cent above it.

Baloon

All bristles are gray save the anterior ones which for a distance of 60 cent. are white toward back bristles are very dark gray, almost brown.

Measurements

1	Total length	= 1805
3	Snout to eye	= 361
5	" " blowhole (center)	= 310
6	" " post. inst. of pectoral	= 6251
8	Eye to ear (center)	= 90
10	" opening	= 9
11	Ear "	= 3
19	Pectoral, tip to post. inst.	= 150
20	" " " ant. "	= 1951
21	" greatest breadth	= 52
24	Greatest breadth flukes ant-post	= 103
26	Length right lobe (axially)	= 206
31	" " blowhole straight	= 43
32	" left " "	= 44
33	Distance apart flukes anteriorly	= 3
34	" " posteriorly	= 20
40	Length balloon row (straight)	= 345'

4.30 P.M.

W 12 Finback ♂ May 22/10 Aikawa

Color Left side top of head is dark slate or neutral - Right side has lighter semi-circular area running upward and forward from fin as far as below and forward along outer half of rostrum not reaching tip. On the top of the head are irregular light patches looking as tho the epidermis had been rubbed off. Back and extreme upper sides are slate - on left side a light band runs to eye. The under edge of the snout is flesh pink for same distance as white portion of baleen.

Left ramus very dark slate (almost black) to ~~for~~^{onto} 1/4 feeds below the corner of mouth this color extends. This dark color is narrower near distal end of ramus & widens as it goes backward.

Right ramus ^{side of throat} very light gray (about white) shading into the white of the central throat. A very dark patch or band runs backward out of corner of mouth -

The gray of the sides comes down very far on the peduncle leaving only a narrow mid ventral strip white. The peduncle to lower sides are a beautiful d' so bella gray - In instead of two narrow bands of gray running down

onto the folds from the root of the fin & from the tip of fin laid back, the gray is in two very wide bands, & are almost solid. They are broken by a narrow band of whitish from tip of fin laid back to a broad white streak from the root of the fin. In other words the gray bands are on this shall so broad that they cover all but the two ~~several~~ streaks of white mentioned above.

12 folds under the left fin are dark.
21 dark furrows under right fin.
14 folds under eye left side are dark shading off into white.

10 furrows between fins are flesh colored - rest are dark.

Pectorals Right below white except for gray posterior border & tip - gray covers all of tip except very anterior edge. On the upper surface the white from below runs along up over anterior edge, notch flukes not lapped

21⁰

Measurements of no. 12

1	Total length	= 1860
3	Snout to eye	= 392
10	Eye opening	= 10
12	Width of flukes + anus	= 55.0
16	" " " post. nostr. down	= 445.
18	Pectoral (tip to head of baleen) =	233
19	" " " post. nostr.	= 146
20	" " " ant. "	= 203
21	" greatest breadth	= 57
22	Height dorsal (vertical)	= 37
23	Flukes tip to tip	= 4351
24	Greatest breadth flukes (ant. post.) =	108
25	Dept width of flukes	= 20
26	Length left lobe	= 230
28	Length row of baleen	= 385 -
41	" longest plate baleen	= 90
#	" white patches "	= 110

Snout to dorsal = 445 +

8 P.M.

No. 13 Finback ♂ May 22/0 - Aukawa

Color A dark whale - much darker than No. 12.
 Left ramus, and 18 inches of the folds below it for whole length from tip to a little behind corner of mouth are very dark slate (almost black). The dark area is narrow at distal end of ramus, widening proximally. Fifteen folds under left fin are dark - Thirty-four furrows under left eye are dark & 15 folds are dark the rest are white.

The slate under the fin is in the shape of two broad bands (almost solid) broken only by two whitish lines, from base of fin to tip of fin laid back, which run obliquely downward & backward.

Flukes The dark edging below is fairly heavy.

Pectorals The white of the lower surface runs up over the edge (ant.) above for the distal $\frac{2}{3}$ of the fin.



The peduncle is thickly scarred.

✓ 0.9

Measurements of No. 13

1	Total length	= 1860
3	Snout to eye	= 390
12	Notch to anus	= 515-
13	" " penis (everted)	= 643
15	" " navel	= 868
16	" " post. inst. of ^{dorsal} pectoral	= 45.0
17	" " " " " ^{pectoral} insertion	= 127.5
19	Pectoral tip to post. inst. ^{anterior} of ^{of} anterior	= 165-
20	" " " anterior inst.	= 230
21	" greatest breadth	= 5.3
22	Height dorsal vertical	= 4.51
23	Filament tips to tip	= 41.0
24	Breadth filaments (ant-post)	= 100
25	Depth notch	= 20
26	Length right lobe axially	= 270 (220)
29	Depth peduncle at ant. inst. filaments	= 85.
36	Anus to penis	= 128
37	" " " navel	> 35-3
44	Number of throat furrows	= 76

Contained fetus & no. 14a

2.30 P.M.

no. 14

Color.

Blue whale ♀ May 24/10, Aikawa
 A very light whale. The back from tip of fin said back is gray with scattered light ^{gray} markings, to ~~a~~ ^{about} nearly root of fin. Rest of the back (posteriorly) is thickly marked with light gray, on the peduncle being almost solid. The sides of the peduncle are not only thickly covered with very light gray markings but also many rather small white scars. This gives the peduncle the same "crippled" appearance which I observed ^{one} in the Blue whale at Orkney.

Under the fin is a large white patch and a line of scattered white markings run obliquely downward & backward from it. Also on the side folds directly opposite navel are many white markings.

Ramus light bluish slate, & throat folds under it are ~~a~~ ^{little} darker slate. On the throat folds there are no white markings but a few ashy ones on breast.

Pectoral

(Photographed) Above has proximal $\frac{1}{3}$ all slate gray & distal $\frac{2}{3}$ has ant. edge white, this band becoming

broaden toward tip. Tip is injured.
Below all white white
slate gray

Dorsal Has anterior sides light caused by the rather faint grayish lines running down back from anterior edge. Tip is dark gray & has been injured as also has posterior edge.

Flukes Flukes have central portion white thick line with rather coarse gray lines - the anterior edge is heavily lined & the posterior edges almost solid as are the tips. The under side is different from the majority of Blue Whales, viz; the white is more distinct & the curving lines are broader & not so close together. I have seen only one or two others like this specimen.

Measurements over page

1	Total length	= 2880
3	Sinout to eye (Suture believed correct) (taken in 2 sections)	= 470
12	notch to anus.	= 720
16	" " post. most. of dorsal	= 560
17	" " " " " pectoral	= 1490
18	Pectoral tip to head of humerus	= 360
19	" " " post. spines etc	= 245-
20	" " ant. "	= 310
21	" greater breadth	= 88'
22	Height dorsal (vertical)	= 19
24	Greater breadth flukes (ant. post.)	= 125-

No 14a *Footes Blue whale* ♀ May 24/10 Aikawa
Mother is no. 14 millimeters

1	Length over back	= 1660
2	Cir. of body opp. tip of fin laid back	= 880
3	Snout to eye	= 330
5	" " blowhole center	= 260
6	" " post. inst. pectoral	= 620
7	" " " dorsal	= 1270
8	Eye to ear (center)	= 130
9	" above ear	= 8
10	Opening of eye	= 18
12	notch of flukes to anus	= 360
14	" " " " mammary slit	= 600
15	" " " " navel	= 820
16	" " " " postinst. dorsal	= 470
17	" " " " " " pectoral	= 1120
18	Pectoral tip to head humerus	= 300
19	" " post. inst	= 220
20	" " ante "	= 260
21	" greatest breadth	= 70
22	Height of dorsal ventral	= 82
23	Flukes tips to tip	= 430
24	" greatest breadth ant-post	= 170
25	" depth notch	= 30
26	Length right lobe (axially)	= 255-
27	" left " "	= 248
29	Depth peduncle at ant. vent. flukes	= 125-
30	" " between "	
	and anus	= 190
31	Length right blowhole straight	= 45-

32	Length left flar hole straight	= 40.
33	Dist. apart " anteriorly	= 6
34	" " " posteriorly	~ 35-
38	Length of mammary slit	= 20
39	Dist. between " " s	= 23
44	Number of throat furrows	= 65~

The rudimentary teeth in this specimen were well developed.

10 P.M.

61

No. 15-

Color

Finback ♀ juv. May 20-1/10 Aikawa
Back slate - the slate reaches
on to the side 90 cent. from the
mid-dorsal line, opposite the tip
of the fin laid back.

Left ramus bluish-white at
distal end shading into very
light gray proximally - Right
ramus very dark slate.

The widest peduncle light slate gray -
Ant. edge white for whole length above
rest blue-gray - Below posterior edge
has edging one inch wide of grayish
and distal $\frac{1}{4}$ of fin is grayish - all
rest white below.

Flukes white below, except tips, posterior
edge nearly to notch, and anterior
edge dark slate. The slate on anterior
edge is narrow near insertion
of flukes & toward tips becomes
broader. The posterior dark edging
is about 8 inches wide. The notch
is not lipped.

Bristles are all yellowish-white,
except the proximal $\frac{1}{6}$ which are
grayish for whole length of plates.

There are 90 white plates in the white
portion on the right side - the white portion
shades gradually into the dark-edged
plates, [14 pros of ribs sure]

Fins

Flukes

Bristles

17. V

Measurements of No 15

1	Total length	= 1135-
3	Snout to eye	= 202
5-	" blowhole (center)	= 170
6	" post. mid. of pectoral	= 35-0
8	Eye to ear center	= 50
9	" above "	= 8
10	" opening	= 7
11	Ear "	= 4
14	Width of flukes to mammary slit	= 404
16	" " " post. mid. ^{dorsal} pectoral	= 330
17	" " " " " pectoral	= 805.
18	Pectoral tip to head humerus	= 150
19	" " " post. mid.	= 100
20	" " " ant. "	= 130.
21	" greatest breadth	= 36
22	Height dorsal	= 20
23	Flukes tip to tip	= 245
27	Length left lobe axially	= 137
28	Greatest thickness flukes at mid. =	23
29	Dipt peduncle at "	= 75-
30	" " between " & arms	= 137
40	Length row of baleen	= 190
41	" longest " plates	= 95-
42	Number of plates of baleen ^{on side} =	306
43	Lower jaw extends beyond upper	= 16
44	Length white portion of baleen	= 40

4-45-9. m.

no 16 Finback ♂ May 28/10 Aikawa
 This whale was not drawn entirely out of the water upon the slip, so it was necessary to take the length in two sections - it is undoubtedly correct. Was taken along back as usual.

Color

Rather a dark whale. Back is slate shading into ^{light} gray on the sides & lower sides - slate covers back nearly down to root of fin ^{for about 18 inches}. Left ~~side~~ ramus & upper side of throat, ^{below ramus} very dark slate (almost black) but there are 11 dark folds under left eye - and 32 dark furrows - that is all the furrows on the left side of throat from the very median line are dark. There are 14 pink furrows in throat between eyes, these being therefore entirely on the right side. The two gray bands under the fin are very broad being broken only by the two light bands from the ^{front of} the fin to the tip laid back - these light bands are very narrow.

Right ramus is very light gray, it is lightest at tip (here almost white) and gets darker gradually toward the proximal part. The inside of the right ramus is dark slate inside left ramus is light gray -

Pectorals

Above slate - distal $\frac{2}{3}$ has ant. edge
whitish - tip injured - Below white, hav-
ing tip, posterior edge + ~~posterior edge~~
grayish. (above) white
slate

Bristles

Dirty or yellowish white ^{except} extreme
tips which are gray. The posterior plates
for about 18 inches have bristles
all brownish-gray. Baleen begins
16 cent from tip of snout. The white
portion of the baleen on the right side is
70 cent. in length. But plates which
have their lower halves white & upper
dark (outer edges) extend for 20 cent.
further. Thus the white portion
fades gradually off into the dark.
Mucous membrane in roof mouth
is purplish white - rather flesh colored
blotched with purple.

Hairs

The hairs on the mandibular sym-
physis were 2.5 mm. long and embedded
for half their length. They were "
very loosely & could be pulled out
with little difficulty, were dirty
white.

Ribs

14 pairs of ribs (sure)

Spine

Length straight below = 415 cent.

Jaw

" " jaw = 405 "

" curved " = 470 "

Measurements No. 16

1	Total length	= 1910
3	Snout to eye	= 352
5	" " fluke	= 305,
8	Eye to ear (center)	= 86
9	" above "	= 7
10	" opening	= 9
11	Ear "	= 3
12	Notch flukes to anus	= 335-
13	" " " penis	= 6651
15	" " " navel	= 8518
16	" " " post. inst. dorsal	= 430
17	" " " pectoral	= 1240
18	Pectoral tip to head humerus	= 205-
19	" " post insertion	= 125-
20	" " ant. "	= 170
21	" greatest breadth	= 30
24	Flukes " " ant-post	= 90
36	Anus to penis	= 130
37	" " navel	= 823
40	Length baleen row	= 340
41	" longest baleen plate	= 92
44	Number serrated furrows	= 64
1	Length white portion of baleen	= 70

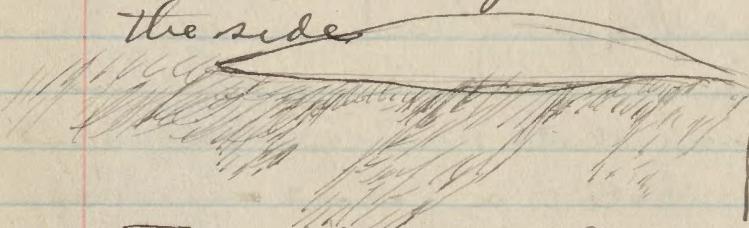
9 P.M.

no 17 Finback ♂ May 29/10 Aikawa
 This whale was measured by the
 cutters and as the head was well
 under water I can be by no means
 sure that the length as taken was
 correct.

Color

A dark individual. Left side
 top of head slate. Right side, toward
 + at the side of blowholes I could
 distinguish lighter color but
 the remainder of the right side
 seemed to be the same as the left
 side top of head. Right ramus
 white at tip shading backward into
 very light French gray - many
 white "scars" on ramus. Between
 the very dark band running out of
 corner of the mouth right side reaches
 half way to the fin insertion.
 Between the corner of the mouth
 + the fin, right side ^{there is} an irregular
 patch of gray ramus downward
 which covers 13 folds. The grayish
 covers the entire space + forms
 a rough semi-circle between
 these two points. At the root of the
 fin a rather small + indistinct
 grayish band goes down to back
 obliquely - there is then a whitish
 space of about half the length of

the fin laid back, a gray band 4 ft. long & 18 inches wide, runs down & back. This band is well marked & square at the distal end. Next comes a white space & then follows the tip of the fin laid back, a third short band begins which merges into the gray of the sides



Left ramus very dark slate
for 18 inches below it on the upper ends of the folds. The dark slate of the ramus shades into gray gradually as it goes back toward fin.

From the end of the folds on the sides to the genitalia the line of light gray is almost straight; it then begins to slant down regularly to the flukes, ~~where~~ it is reaching within two or three inches of the mid-ventral line at the flukes insertion. The gray goes into the white of the sides rather abruptly; many white scars on the peduncle

1	Total length (measured by whalers along side)	= 60 ft.
16	Noth of flukes to post. inst. of dorsal	= 440
18	Pectoral tip to head of humerus	= 200
21	" greatest breadth	= 55
29	Depth peduncle at ant. inst. of flukes	= 80

(Tip of pectoral badly injured)

9 P.M.

No. 19 Sei whale ♂ June 8/10 Aikawa

This whale was drawn entirely out of the slip and I took the measurements with the greatest care. I did not get an opportunity to examine carefully the back or ~~the~~ top of head - ~~but~~^{but} observation showed it to be dark slate.

The left lip & ramus of mandible has the upper half dark gray and the lower half very light gray becoming almost white at tip. Inside of right ramus & tip is dark slate. The throat and breast are white to a point about opposite the middle of the fin laid back. Here a band about 125 cent. in width with irregular margins, which extends back to a point a little behind the navel runs down from the sides entirely across belly. This band is gray & considerably darker than the lower sides of the peduncle. ^{The folds just in front of this dark band are} ~~From the indicated pinkish light~~ On the left side of the body under the dark gray from the upper half of the lower lip extends backward becoming wider & wider until ~~at~~ between corner of mouth & eye anterior insertion of pectoral it spreads ~~outward~~ ^{large} outward & downward in a ~~swelling~~ ^{with irregular margins} ~~near~~ ^{widens} blotch ~~which extends~~ ^{under} ~~which extends~~ ^{widens} nicely under the left fin this dark area

Color
A dark whale

The ~~inner~~ edges
of the snout
on either side
for a distance
of 30 cent. are
pink. This
light area
coincides in
extent with
the white portion
of the ~~whale's~~
^{upper} holes
on each side.

(it is considerably darker than
the sides of the body.)
 covers 14 folds: From a point about
opposite the navel the dark slate of the back
shades off gradually into gray on the
lower sides which covers the entire
ventral line from the anus to the flukes.
 ventral line from a little behind
navel to the anus has there is a nar-
row area of light pink. The sides of the
body are covered with small ^{gray} elongate spots
(having rounded corners) which seem
to be composed of fine wavy lines radiating
outward from a common center.

as in this sketch. (I have noticed many
~~similar~~ markings on the Finbacks & Blue
whales here, and on the Finbacks of

n. B. ^{also}
yes, ^{July 31/10}  as in this sketch. (I have noticed many
markings on the Finbacks & Blue
whales here, and on the Finbacks of
alaska & Vancouver Id. whether or not
they are caused by a parasite I have not
yet determined.) There were also a
great number of white scars on
the sides of the body which were un-
doubtedly produced by a parasite
~~classified~~ of some sort, as I found
fresh ~~scar~~ pits, some partly healed,
& others entirely so. In the fresh
pits were granular ~~membrane~~ membranes
evidently left by the parasite when it
was detached from its host. On
the Finbacks & Blue whales the same
pits and scars were found.

I did not have an opportunity to examine the right side of this whale carefully, but from hurried observations I believe that the right ramus was mostly light gray and that a ~~similar~~ dark gray blotch similar to the one on the left side, was present under the fin. There was also a distinctly lighter area near the left eye but how far it extended I could not tell as the blubber was removed before I had a chance to describe it. (See no 4)

Flukes

The central portion of both lobes of the flukes (below) is light gray about like the sides of the peduncle. The distal half of each lobe as well as a wide band along the posterior & anterior edges is dark gray. Above the flukes are dark gray like the back.

Pectorals

The upper surface of the fin is blue slate which lightens somewhat along the ^{anterior} edge of the distal half of fin. Below, the anterior half of fin for the whole length is light blue gray which shades off very gradually into the darker gray of the posterior half. The color of the lower surface seems to be ~~grey~~ produced by extremely fine ~~grey~~ blues which

Situated on a slight swelling - above it is one long convex furrow 18 cent. in length - At this furrow is 6 cent. above anterior commissure of eye - between it & eye are two short lines or creases - Below eye a crease 24 long ~~extends~~ curves - it is 5 cent below ant. commissure - 2 furrows 6 cent. long run out of ant. corners of eye

run from the tip down the posterior border curving obliquely off toward the anterior edge; near the base of the fin the lines run in a curve across fin from post. to ant. edge. These lines are so extremely fine that it looks like solid color and can only be detected upon close examination.

The lower half of the anterior edge is light gray. The upper half " " " is darker gray, the line of division being well marked.

The fin is narrowly lanceolate, ^{triangular} in shape. The anterior edge is (almost) straight) very slightly convex, & The posterior edge swells gradually outward and backward ^{from the tip} until about middle of fin is reached, when it turns very gradually inward to the posterior angle which is not strongly marked. The fin is widest ^{a wide bend} ~~about~~ the middle of its length, and it is here that the anterior edge is thickest. From that point the ant. edge tapers gradually toward tip until it becomes thin. The posterior edge is thin but fairly rigid until the point of greatest breadth is reached, where from there to the axilla the posterior edge is loose skin

& blubber. (Both sides photographed)

Dorsal

The dorsal fin is large & high, ~~but~~ ^{before broken} is deeply concave and deeply falcate. The tip "overhangs" so greatly that it will not stand erect, tending to either side. The color is dark slate like the back. (Photographed)

Baleen

It was impossible to get a very good view of the baleen of this whale while it was intact as the light was poor. However all the bristles of the ~~anterior~~ ^{distal} half of the rows seemed to be all white. The ~~tip~~ ^{at tip} of the proximal half were all grayish, ~~and~~ ^{and} ~~after~~ ^{after} the very proximal portion (about $\frac{1}{6}$ of the entire row) had bristles all grayish. I counted carefully the plates on the left side from the very anterior bristles two inches high to the posterior ones. There were but 290 on this side.

The anterior plates of baleen for 1/6 cent. ^{see} on each side were yellowish white.

I examined carefully all the baleen plates which were spread out to dry in the sun before the ship.

The color of the baleen is very hard to describe in as much as it changes

with the angle of light. When examined
~~in the sunlight~~ all the dark portions
of the plates, ^{in both sides} possessed a marked iride-
cence. At one angle the color of
the plate was a beautiful blue; at another
angle the color was light green. When
examined out of the sun, the color was
a deep blue-black, which however
changed to a lighter shade when held at
a different angle. Along the inner
basal edge, the majority of the plates
have longitudinal bands of yellowish
white, which shades into gray and
finally runs insensibly into the
blue black of the main ^{part of the} plate. The
width of the white & gray bands varies
greatly; some plates had a white band
35 to 40 mil. wide shading into a gray band
of similar breadth. These were the most
anterior ones of the row. Others had only
a narrow edging of gray. My study
of the talleen of No. 4 showed that this
white basal stripe is widest at the
anterior portion of the talleen row
~~is seen~~ becoming less & less toward
the back until it is lost entirely
in the posterior $\frac{1}{3}$ of the row.

Three hundred & eleven plates were
spread upon the slip to dry. Out of

more or less

this number 230 had white or gray along the edge. Eighty-one plates ~~away~~^{away}, showed no lighter color. Of course these plates were only those which were of commercial value.

All the plates are transversely rugose, in proportion to the size of the plate the ridges being fully as prominent as those of the Finback or Blue whale.

As in the two latter the ridges are most prominent in the basal portion of the plate (The bistles of all these plates were yellowish white except at the tops of the plates where the coarse bistles became grayish or brownish.)

Osteology

- Scapula The right scapula of this whale was saved, cleaned, measured & photographed,
- 1 Height (vertical) = 575 mil.
 - 2 Greatest breadth = 960 "
 - 3 Length acromion (median) = ~~110~~ .. 260
 - 4 " coracoid " = ~~260~~ .. 110
 - 5 Ant. post. length glenoid fossa = 200 mil.
 - 6 Width ^{acromion} coracoid = 90 mil.
 - 7 " ^{coracoid} acromion distally = 40 mil.

The scapula is widely fan-shaped. The super-scapular edge is ^{thus} remarkably flat, dipping at a sharp angle to meet the posterior edge ^{and descending to a regular} which is straight after

~~it rises above the neck of the scapula. The coracoid edge is irregularly convex; it meets the surface ofular border meets it in a regular curve~~

~~curve to meet the coracoid border. The edge is very thin. The posterior edge of the scapula is straight after it leaves the neck of the scapula; the coracoid edge is irregularly convex.~~

~~The ^{acromion} coracoid is long, slightly curved inward & is directed outward & somewhat upward. cl is about the same breadth throughout.~~

~~The ^{coracoid} acromion is directed inward & downward. cl narrows gradually & is 40 mil. wide broad at its distal end.~~

The prescapular fossa is not well defined.

Manus

The formula of the phalanges is
~~II III IV V~~ taking as the 2nd digit
 4 7 5 3 the external one at the end of the radius (which would correspond with the index finger)

Length of 2nd digit including metacarpal = 480 mil

"	"	3rd	"	"	"	= 710
"	"	4th	"	"	"	= 600
"	"	5th	"	"	"	= 340

(over)

Last phalanx of 2nd digit is 25 mil. long

" " " 3rd " " 15 " "

" " " 4th " " 40 " "

" " " 5th " " 30 " "

The last phalanx of the 3rd. digit is 16 mil. from the ~~extreme tip~~ of the fin.

The last phalanx of the 4th. digit is 60 mil. from the edge of the fin

It will be seen that the formula for the phalanges of this specimen is unlike that of Sei whale no 2. which

The latter formula is II II IV V

4 6 5 2

yet I am absolutely positive that both are correct. The fins of both specimens were dissected by myself with the greatest care & there is no possibility that any of the phalanges of no. 2 were overlooked.

Carpals

There are 5 carpal ossifications - 3 in the proximal row & 2 in the distal row. The ossification opposite the base of the 4th & 5th digit is the largest of them all. The one next to it is a little smaller & the one next to this is still smaller.

The two of the distal row are small. The pisiform cartilage is prominent & had just begun to ossify - it is 75 mil. long.

RostrumMeasurements of Senegal no. 19

The edges of the rostrum for the proximal $\frac{2}{3}$ of its length are almost straight. They then turn rather abruptly inward meeting at an acute angle.

Measurements no. 19

1	Snout to eye Total length	= 135.0
3	Snout to eye	= 27.0
5	" " blowhole	= 22.5
6	" " post. insert pectoral	= 48.0
8	Eye to ear	= 7.3
9	" above "	= 9
10	" opening	= 7.5
11	Ear "	= .5
12	Flukes to arms	= 36.0
13	" " penis	= 4.3
15	" " naval	=
16	" " post. insert of dorsal	= 41.0
17	" " " " " pectoral	= 9.2
18	Pectoral tip to head bony process	= 1.8
19	" " " post. insert.	= 11.7
20	" " " ant. "	= 14.6
21	" greatest breadth	= 3.8
22	Dorsal, ventral height	= 4.5
23	Flukes tip to tip	= 33.0
24	" ant. post. breadth	= 9.8
25	" depth notch	= 2.0
26	" length right lobe axially	= 17.8
27	" " left " "	= 18.5
28	Thickness flukes at insertions (over)	= 2.2

29	Dept. furcula ant. most. fleeks	= 70
31	Length right baleen (st.)	= 36
32	" left "	= 36
33	Dist. apart "	= 4
34	" "	= 23
39	Length baleen raw	= 263
41	" longest plate	= 75
42	number plates baleen (left side)	= 290
44	" throat folds	= 50

8.30 P.M.

No. 20 Finback of June 9/10 Aikawa

This whale, the largest Finback I have so far seen, contained a foetus (?) about 3 ft. long. This animal presented peculiarities of coloring such as I have never seen in a Finback before. They were so striking that Mr. Matsumaka, the cutting manager, asked me if I did not think it a cross of Finback & Sei whale. I do not believe that such could have been the case, as the color peculiarities were simply exaggerations of the usual Finback type. The baleen, fins, flukes, etc. were all typically Finback.

Color

I did not have an opportunity to examine carefully the head. The back was neutral tint shading off into light gray on the sides. The tip and right edge of the rostrum ^{above} were marbled with white, dark slate and brownish gray for a distance of 130 cent.
Belly On the under side it was ~~for~~ white & light pink. This area ~~would~~ be same extent as the white portion of the baleen row. There was a ~~large~~ semicircular area just in front of left fin which was distinctly lighter in color than back. A similar one appeared to be on the right side but this was stripped before I could examine it carefully.

The sides of the peduncle are light gray which from the arms back leave only a very narrow ^{white} ventral strip; this is lost entirely about 2 ft. in front of the flukes in section, the gray covering the ventral line here. Just behind the arms, two narrow points extend obliquely forward from the gray of the lower sides, but do not meet in the mid-ventral line. On the left side all of the fins from the mid-ventral line are dark.

Notice

On either side of the belly opposite the tips of the fins laid back, two gray bands extend downward & backward obliquely meeting on the mid ventral line to form a V, the apex being about four feet in front of the umbilicus. The right arm of the V is solid color - the left arm is broken. A narrow, broken band of grayish extends from the apex of the V back to the navel. Opposite the middle of the fin laid back on the left side is a grayish blotch - on the right side instead of a blotch it has the form of a ~~second~~ band which meets with the right arm of the V a short distance from the apex.

Opposite the navel two more bands

beneath either side, come down, not quite reaching the ventral line. (It was the foregoing peculiarity's of coloring which suggested the sei whale to Mr. Matsumaka)

- F. flukes Have a wide ant. & posterior border of very dark gray (below) & the tips for one fourth of each lobe are dark gray. The posterior border is much wider than the anterior - Above all slate gray.
- Pectorals Above, fin all slate gray, the distal edge is white & this shows on the superior surface of the fin as a narrow band for whole length of ant. edge. Below, white, with much gray along posterior edge of distal half; two narrow, parallel gray lines run from tip toward & center of fin. There is also a grayish blotch at posterior insertion which extends across fin half way to anterior edge. Tips not injured.

Measurements

1	Total length (measured in sea. by whalers);	= 46 ft
3	Snout to eye	= 414
8	Eye to ear	= 94
9	" above "	= 7
10	" opening "	= 10
11	Ear "	= 51
18	Fin tip to head numerus	= 247
19	" " " capost ninst.	= 120
20	" " " ant. "	= 215

21	Breadth pectoral	= 57
23	Fleches tips to tips (estimated from length of lobes)	= 440
26	Length right lobe tip to notch along post. border	= 225
27	" left " axially	= 235
40	" row of baccaen	= 406
41	" largest plate	= 90
	Length white part of baccaen (right side)	= 105-
128	white plates in white pectoral	

no. 21 Humpback June 9 ♂ juv. Aikawa

Color

Top of head back & sides black - Below, the throat, breast, & belly has a good deal of white which is mostly in small flecks & dashes - many of the folds are edged with white - The white spot no characteristic of the Van. & Alaska Humpbacks was large between the fins on mid ventral line was well marked. Another small patch of pink on mid-ventral line directly below corner of mouth. The eyelids are flecked with white & much white in flecks about eye & corner of mouth. "Pepper & salt" about genitalia & ~~from~~ back to "hump" or lower edge of peduncle. a little white about nose. There were few of the circular & semi-circular markings or scars. A few small white flecks & dots on the upper sides of the peduncle.

Flukes

Black above & below with only a very few white flecks along & near tips.

Fins.

Below white except for an irregular blotch at base, an edging 1 cent. wide along post. edge & a few spots at tip. Black above with a very few white markings ~~near~~ at tips. The fins were colored exactly like typical ones at Van. & Alaska.

Eight bunches on ant. edge - 1st is prominent, next two low & rounded,

Photographed

4th prominent, next 2 low & last two near tips fairly prominent - The 1st - 4th & last two bear barnacles.

Flukes
(cont.).

The post. edge of the flukes is scalloped as in Alaska & Van specimens. Many barnacles on tips.

External characters The upper edge of the peduncle between dorsal & flukes is crenulated - there are seven "scallops" - low.

There are 10 tubercles along right ramus. Many barnacles on "chin" & fore-throat.

The tubercles are top of rostrum seemed to be arranged like those of Van. Hump-backs - did not count them. Stomach contained Euphausia

Dorsal

Has a little white along ant. edge & tip. dt is low & has typical humpback shape. (Photographed)

Baleen

Bristles dirty white - a grayish-brown band along whole length of baleen row at extreme base, except the very anterior portion. Tips of post. $\frac{1}{2}$ of raw all grayish & proximal portion has bristles all gray. Mucous membrane pink

This whale had a very short head, the under jaw projecting far beyond upper.

Measurements Humpback no 21

1	Total length	= 880
3	Snout to eye	= 217
5	" " blowhole	= 155-
6	" " post. vent. fin	= 310
10	Eye opening	= 7
12	Nostril flukes to anus	= 220
15	" " " navel	= 390
16	" " post. vent. dorsal	= 290
17	" " " " " pectoral	= 610
18	Pectoral tip to head humerus	= 279
19	" " post. vent.	= 222
20	" " " ant. "	= 258
21	greater head width	= 69
22	Dorsal nuchal height	= 15-
23	Flukes tips to tip	= 310
24	" ant. post. nuchal	= 94
29	Depth peduncle at flukes vent.	= 58
40	Baleen row length	= 207
41	" longest	= 50
43	Lower jaw beyond upper	= 40
44	Number throat grooves	≈ 28

7.30 P.M.

No. 22

Finback ♂ June 10/10 Aikawa

A light whale. On the right side of tip of beak a light area which has its genesis a little anterior to the fin runs up as far as opposite blowholes, a little the other side of the median ridge of the rostrum & shades gradually off into the slightly darker left side. It is lightest near the blowholes along the edge of the rostrum. The slate color of the extreme dorsal ridge is narrow & shades off gradually into the gray of the sides. The sides of the body from the fin back as far as the ends of the furrows, is darker gray than that of the sides of the peduncle but shades into it very gradually. From the dorsal fin back to the flukes the slate of the mid-dorsal region ^{doubt} extends only about 1 1/2 inches ~~onto~~ from the median line shading off then gradually into the light gray of the lower sides. The line of the light gray ~~from~~ the runs parallel with the axes of the body until it reaches ^{a point of} the penis when it slants obliquely down and back until it just reaches mid-ventral line at the flukes, but no where excludes the white of the mid-

Under the tongue there is a great amount
of transparent mucus - probably saliva. 87

ventral region. There are a great number
^{white} of scars - on the peduncle. some of
them oblong and some irregular
& branching. White lines about $\frac{1}{2}$ inch
wide -

The gray, oblique band opposite the tip
of the fin laid back is short & not heavy
~~on the left side~~ or either side. There is
only a suggestion of ~~after~~ the oblique
gray band which usually runs down
from the root of the fin. On the right
side under the fin, 13 furrows are dark
& the remaining ones pink (light). Under
the corner of the mouth on the right side
18 folds are gray - the dark band running
out of the corner of the mouth is short.
The right ramus & lip are very light gray
proximally ~~& white~~ shading into white
distally, (except the extreme edge of the
lip which is ~~dark~~ gray) The very light
gray of the proximal half of ramus
shades very gradually into darker
gray at the fininsertion. The right lip
& ramus is dark gray inside.

The left ramus & lip are dark gray, the
dark shading off gradually into the white
of the throat. Under the left corner of
the mouth 14 folds are dark gray -

The points of gray running forward to anus even
obsolete.

Fin Below white - the distal $\frac{1}{3}$ marbled with gray -
the anterior edge white throughout post.
margin gray - gray at black at root.
Above all slate.

Measurements No. 22

1	Total length (taken by cutters)	= 1830
3	Snout to eye	= 393
5	" " blackhole	= 340
8	Eye to ear	= 93
10	" opening	= 13
11	Ear "	= 3
12	Notch of flukes to anus	= 525
16	" " " post. mid. dorsal	= 440
18	Pectoral tip to head humerus	= 235-
19	" " " post. mid.	= 150
20	" " " ant. "	= 208
21	" breadth	= 52
22	Height dorsal vertical (injured)	= 20
23	Flukes tip to tip	= 870
39	Length valen now	= 380
483	Lower jaw beyond upper white portion of valen length	= 110

4. 30 p. m.

No. 23 Finback ♀ June 11/10 Aikawa

a grayish band (not strongly marked) about 3 inches wide, curves upward then downward from ear to eye; about ear this grayish area is wider (blubber of cut just back of ear) (Ear is a narrow slit & cut long - longer than usual). Out of the post. corner of its ear a whitish band $\frac{1}{2}$ inch wide runs backward. Left ramus very dark gray. The general color of whale is very light. The two narrow gray points which extend forward to areas below are strongly marked.

Fins. Below has distal half all gray - 2 darker gray bands marking the course of the 3rd & 4th digits come from tip a little more than half way to base of middle of fin. The posterior gray margin extends in a sweep across base almost to anterior edge - anterior edge is delicate flesh pink above all blue gray. The tip of the left fin has been "chewed". It shows ~~the~~ teeth marks very distinctly. It looks as tho a Killer had caught hold of the tip & the whale had pulled it out of his mouth, "shredding" the whole tip. He could not have been done by sharks.

Baleen. Bristles of whale baleen row (except white part) have gray tips, this becoming of greater extent

Baleen

posteriorly until the last $\frac{1}{3}$ of the row is all gray. (Therefore my theory that the younger whales have whiter bristles is exploded)

"Blisters"

u.B. July 2nd Further examination continues &
that most at least of the spots were caused
by that parasite

On the peduncle and sides of this whale were many "blisters". The epidermis was raised like a "water-blister". When pulling the epidermis off these places I found a narrow valley below extending thru' the dermis to the blubber beneath. The edges of the ~~dermis~~ about this ~~for~~ valley were "rotten" & could be easily scraped. There were several of these spots in process of healing which showed the light wavy lines, altho' I found no parasites on this whale I am sure they must have been caused by them. Whether or not they were the same parasite which I found on the young Finback I can not say. There was also a line of small round blisters & the dermis beneath was similar to that in the large scars.

Ribs

There were 14 prs of ribs - the last pair did not seem to be "floating" as the tubercle had apparently been attached. I watched both sides when the ribs were cut apart.

Fishes Below have wide strip of post. margin of dark gray & the rest is shell-pink - not white - above slate.

Measurements no 23

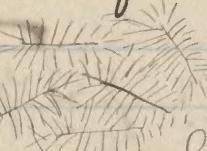
1	Total length	= 1465-
3	Snout to eye	= 274
6	" " blowhole	= 2681
6	" " post-nasal fin	= 4751
8	Eye to ear	= 65
9	" above "	= 7
10	" opening	= 8
11	Ear "	= 8
12	Flukes to anus	= 420
15	" " nose	= 710
16	" " post-nasal dorsal	= 400
17	" " " pectoral	= 990
18	Fins tip to humerus	= 189
19	" " " post. nict.	= 120
20	" " " ant. "	= 159
21	" breaths	= 481
260	Length baleen row	= 2751
41	Largest plate	= 55-
43	Lower jaw beyond upper	= 20
44	Number throat furrows	= 50
	Length white part. of baleen	= 65-

6.15 P. M.

No. 24) Sperm whale ♂ June 11/10 Aikawa

~~The right side of the rostrum + top of~~
~~bead, dark blue gray, darker than the~~
~~peduncle a good deal. Back also dark~~
~~blue gray. The general effect of color~~
~~given by this whale is much like~~
~~a Blue Whale - very light color but~~
~~more bluish on the whole & below,~~

~~A very light whale~~
 Sides of right lower lip + ramus
 all light blue gray, the edge of the
 lip being a trifle darker. (I did not
 see the left ramus) The central
 portion of throat + breast white,
 the furrows being pinkish. Under
 the corner of the mouth on the right
 side there are 14 furrows which are
 dark gray or slate. An irregular border,
^{with irregular expansions} of gray are the folds from the corner
 of mouth under fin + to a point
 nearly opposite the tip of fin laid
 back, where it broadens out ^{abruptly} +
 into a wide band which runs
 across belly joining the gray of the
 folds on the other side. This belly
^{on the folds} "band" is dark blue gray + darker
 than the sides immediately behind & above
 it. From the snout to anus the
 ventral line is bluish white. The
 sides of the peduncle are beautiful
 light blue-gray, becoming lighter

toward the ventral line. Between the navel & anus this runs into bluish white, but behind the anus the ventral line is ^{light} blue gray, and does not become white. The sides of the peduncle are beautifully marked with light lines which radiate from a common center, like the  axes being directed at various angles & the lines running into & joining each other. It is a very difficult pattern to describe. There are also many oblong white ~~spots~~ which seem to have been caused by a parasite's ciliated. I saw one "pit" which contained a granular membrane like that in similar pits on Blue & Frisback whale.

Flukes

Below same color as sides of peduncle except for an ant. & post. & tip margin of dark gray. The flukes are "lined" in same manner as those of the Blue whales, the lines running across in a curve inward from ant. almost to post edge - Above slate.

Each lobe of the flukes is nearly triangular. The posterior edge is ~~straight~~ straight except for a very shallow ~~convexity~~ ^{concavity} at tip. The anterior margin ^{convexity} is straight with just shade of ~~concavity~~

near ~~base~~ the insertion. The anterior edge joins the peduncle abruptly, and does not present that gradual slope so characteristic of the Humpback. The axis of the lobe makes an angle of about 40 degrees with the axis of the peduncle - it is nearly a right-angle.

Pectorals

Below anterior half for whole length very light ^{blue} gray - posterior half gray. The fine "liming" is very distinct on this whale: the lines come down from tip along post. edge then sweep across fin. near base the lines curve from post. to ant. edge the convexity of the curve being up. Above all gray.

Baleen

Bristles white - the posterior half has the tips grayish and the extreme proximal ~~portion~~ matting gray. The plates have the same white & gray stripes along inner basal edge & the same iridescence that I spoke of before.

Ribes

14 prs (sure)

Navel

Navel is about 18 inches behind the end of the longest furrow and is not at the end of the furrows as in Blue & Finback whales.

Beak

Edges of snout below pink for 30 cent each side. Both lower lips ~~to~~ inside have upper halves dark gray & lower halves gray peppered with dark gray.

Measurements Sci whale #24

1	Total length	1450
2	Snout to eye	= 275
5	" " blowlip	= 225
6	" " post. inst. pectoral	= 505
8	Eye to ear	= 77
9	" above "	= 9
10	" opening	= 8
11	Ear "	= 1.5
12	Notch flukes to anus	= 365
15	" " navel	= 630
16	" " post. inst. dorsal	= 430
17	" " " " pectoral	= 950
18	Pectoral tip to head humerus	= 200
19	" " " post. inst.	= 130
20	" " ant. "	= 164
21	" breadth	= 40
22	Dorsal height	= 53
	" ant. post. length	= 60
23	Flukes tips to tip	= 340
24	" breadth	= 97
26	" right lobe axially	= 180
37	Arms to rorace	= 265
40	Tongue balloon row	= 280
41	Largest plate	= 75
43	Lower jaw beyond upper	= 17
44	Number throat furrows	= 32

6.15 A. M. ~~After taxidermy~~

- No 25 - Humpback ♂ June 12 / 10 Aikawa
 This whale was ~~very~~ "thick" & stout. The blubber was very ~~fat~~ thick.
 Head, sides & back, black - the & sides & back marked with a very few small white flecks. Right lower lip thickly marked with circles & semi-circles of white - The ~~at~~ throat breast & belly to the ends of folds, white, thickly & marked with black in flecks & dashes ^{the latter} which are usually directed obliquely down & back. On the right side of the throat just under ramus the black & white is ~~about~~ about equal in quantity. A black band, thickly slashed with white runs obliquely backward from ^{root of} right fin meeting in the mid-ventral line a similar band from left side, thus forming a rough V. The apex of the V is opposite a point about $\frac{1}{3}$ the length of the fin where land back, a few white flecks & streaks between fin & eye. Just forward of penis sheath is a wedge semi-circular band of white; & from this forward to nose a narrow black vertical line, about the "hump" on the ventral line is much white & many circles. The left ramus & lip are black marked with only a few circles of white.

The tip of the snout is white below on both sides - The tongue is blue slate - The mucous membrane in the mouth of the mouth is white tinged with purplish

Fishes

Below white with a narrow ant.-post. band of black along the ridge of the peduncle almost to notch - the post. edge is also margined with black, above black with some white circles Post. margins of fishes scalloped but not deeply

Has usual Humpback shape & has both the entire ant. ^{post.} edge & the tip edge with white

Fins.

Above black with many white circles along ^{entire} post. edge - a cluster of circles near the post. insertion & another cluster at the post. edge near the tip - anterior edge white, with some black at ~~end~~? of the 8 tubercles. Below pure white except for a small black blotch at base & a little black at the tip.

Baleen

When looked at from front & back ~~bundles~~ bristles show dark brown-gray with a narrow dirty light gray band in the center of the row for ~~half~~ to the anterior half. The post. half has all bristles dark brown-gray

320
145
45

Measurements of Humpback No 25 ♂

1	Total length straight neck to tip <u>under jaw</u>	= 46' 7"
2	" " over back " " snout	= 1375-
3	Snout to eye	= 330
5	" " blowhole	= 255
8	Eye to ear	= 58
9	" above "	= 18
10	" opening	= 8
11	Ear "	= 1
12	notch flukes to anus	= 320
13	" " penis center	= 465
15	" " navel	= 605?
16	" " post vent. dorsal	= 435-
17	" " " " " pectoral	= 840
18	Pectoral tip to head humerus	= 407
19	" " " " post vent.	= 330
22	Height dorsae	= 18
23	Flukes tip to tip	= 485.
24	Greatest breadth flukes ant.-post.	= 1151
29	Depth peduncle at ant. vent. of flukes	= 100
30	" " between flukes & anus (at lower bump)	= 150
36	Anus to ^{center} tip of penis	= 145.
40	Length baleen row	= 310
41	" " longest plate	= 74
44	Number throat furrows	= 23
	Tips of baleen 120 apart at widest point as they stand in position	

not

No 26 Sii whale ♂ June 12 /10 Aikawa

A light whale - sides of peduncle a
beautiful light blue gray marked as I have
described in No. 24. The band running
across belly is not strongly marked in
this whale. Between penis & navel the
mid-ventral line is white.
On inside upper half of lips blue-gray -
lower half light gray flecked with dark
gray.

Fishes below lined as are those of a Blue whale
Dorsal dark gray
Bristles of baleen all white, very fine &
thick - they have not the usual gray
tips. The bristles of bodies & No. 24 are
thicker than on any whale I have ever
seen.

Pink edges of snout below for
40 cent. on each side. Tips of baleen
rows in position are 115 cent apart
at their widest.

13 prs. of teeth.

Total length	= 1380
Snout to eye	= 2651
" " blowhole	= 200
" " post. nostril fin	= 470
Eye to ear	= 74
" above "	= 6
" opening	= 7
Ear "	= 3

Notch of flukes to arms	= 360
" " " post. with dorsal	= 420
" " " " " pectoral	= 890
Height of dorsal	= 5.2
Length right lobe of flukes axially	= 175
Arms to naval	= 270
Length baleen rods	= 270
" " longest plate	= 751

no. 7 Tursiops borealis (Peale) June 13/1910 Akkawa Japan and Lagenorhynchus obliquidens Gill

On the evening of June 13/1910 the "Akakoma Maru" Capt. Skontorp brought in five porpoises - 2 specimens of Lagenorhynchus obliquidens Gill, and three adult examples of Tursiops borealis (Peale).^{2 ♂ and one ♀}
 The specimens had been killed for the day previous and were not described by me until the morning of the 14th. Decomposition had of course set in to a certain extent and ~~the~~ all the animals were more or less swelled ~~as also~~ by the resulting gases. Therefore ~~the~~ the girth measurements of the area between the orbits & pectoral fins ~~were not taken~~ & only the pectorals ~~are~~ are only approximate the actual circumferences in life: the two girth measurements taken anterior to the pectorals ^{+ at the same time} were affected but slightly by decomposition. The specimens were placed side by side in a convenient shed and I did not examine them at my leisure thus having an exceptional opportunity for direct comparison, & being able to note individual & sex differences. They ~~were also~~ Both species were also compared with Scammon's figures published in Tris. Deepfindal a copy of which I fortunately had with me at the time.

No 27 Invis borealis (Peale) June 12/10 Akkawa Japan
 This specimen was ^{apparently} adject, the teeth however
 being unscarred

Color Below: The extreme tip of the mandible is black for 19 mil. ~~This is the~~ portion immediately succeeding is bluish white for except a distance of 7 mil. except the ^{upper} extreme edges of the mandible tip which have a narrow edging of black. Behind this is a funnel shaped area of slate color the "snout" of the funnel being 13.5 mil long ~~is~~ and occupying the ventral area of the mandible; the sides of the mandible above this are black. The greatest width of the funnel shaped slate area is 18 mil. A narrow white line runs down the exact center of the throat thru the slate area ~~is~~ the anterior end of the line spreading out & shading off gradually into slate. The posterior end of this median white line ~~spreads~~ widens gradually until it is 30 mil wide, where ^{at 20 mil below tip of snout bristles} it suddenly ~~swell~~ curves out each arm curving obliquely backward & upward to the anterior insertion of the ~~flat~~ ^{suspending} sectoral fins. It runs obliquely up & back on the under base of the fin ending in a point. ~~From the~~ The white begins again at the extreme base of the fin & runs straight back for a distance of 110 mil, then curves rather abruptly ~~swells~~ down & back

toward the ventral line, it then runs back along the mid ventral line of the body in a band of varying width. At its narrowest point, between the ~~first~~ fins & the nose this band is 38 mm wide. It widens slightly ~~at~~ over the penis slit, comes in a bit between the penis & anus, widens again ~~at the anus~~ & then runs backward regularly ~~to~~ to the flukes along the mid ventral edge ~~of~~ the peduncle ^{and} ~~it~~ is lost 20 mm from the notch of the flukes at the same point that the "belly" on the under surface of the flukes is lost. The edges of the white area are sharply defined, but from the fins back to the flukes ~~the~~ ^{along} the edges for several cent. the ~~edge of~~ color is ~~the~~ slate shading imperceptably into the black.



I am convinced that if the animal were examined immediately after death that this slate shading along the edges of the white would be considerably more distinct than they are at present.

Above: Entirely ~~gray~~ black black,

except for the upper edge of the peduncle
for a distance of 25 mm from the
end of the ridge on the flukes which
is distinctly slate color shading
into the black. Also the edge of the
upper lip on each side for a dist
of ~~25~~⁴⁰ mm is white. I believe that
if examined when fresh the
color of the upper parts would be
found to be dark slate and
not black.

Flukes Above black succumbed to slate -
Below ~~the~~ a narrow band of dark slate
— runs across flukes along side of median
keel - The posterior edge has a margin
of slate, widest at notch, here joining the
anat. post. bands. Rest of flukes below
are white

Pectorals Above black, below black except for the
narrow point of white which runs up
on the back from the white of the breast.

Color & anatomy No 28 ♂
No 28 ♂ has the white near the tip of its
under jaw not so long. There is no white
edging to the upper jaw on the left side
just a suggestion of it on the right.
The white ventral band between pectorals & fins is
much narrower than in no 27 & the slate
along the edges here is more distinct. The

flukes below ~~have~~^{have} a little wider dark slate band along the median keel. The flukes above are of a lighter slate than no. 27 ^{and part.}

no 29 ♀

The fine white line in the throat is short & flat anteriorly. The throat slate area is indistinct - The whitish edging to the upper lip is obsolete - The white mid ventral band between fins. & vulva is much broader than in the other two. The flukes below have the tips dark slate. Flukes above lighter slate than no 27 - same color as no 28

Variations in Body form

No 28 ♂ is very slender and does not appear to be greatly distended by gas. It is strikingly different from No. 29 ♀ in body outline, which is a decidedly ~~beginning to~~ thicker whale. No 27 ♂ is intermediate between 28 ♂ & 29 ♀.

The outline of the body of 28 ♂ seems to be fairly typical & ~~will~~ may be described as follows. From the short snout the ~~head~~ outline of the head slants back^{up} gradually to a point opposite a little anterior to the corner of the mouth where it flattens. At lips slightly

at the blowhole, then ~~slopes~~ gradually making the outline of the back between the fins & penis convex. The upper edge of the peduncle a little behind anus is fairly straight. Below the edge of the peduncle from fleches to anus is fairly straight, from that point gradually swelling outward to form belly. The belly & breast line ~~were~~ gradually sweep on to throat.

Variations in Head shape.

^{Viewed from the side} The ~~upper~~ ^{upper} slant from the mouth is a little longer in no 278 than in no 288 - in the former the head flattens off at the corner of the mouth. In 288 the flattened area begins a little anterior to this. That is the "forehead" is higher in 288 ^{+ the slope more abrupt}. In 298 the head outline is decidedly different. The slant is more gradual and altho' it is no longer, the position of the body anterior to the fins is decidedly more depressed giving the head a much sharper appearance. The forehead is ~~much~~ lower. This sharpness to the anterior portion of the body is accentuated by the fact that the body behind the fins is much thicker than in the others. This is ~~probably~~, a sexual difference.

* 28 has tip of snout considerably broken

Measurements do not bring out these differences in head shape because the ♀ is much thicker in proportion to the length than the ♂'s and consequently girth measurements are equalized

since the two males do not show it

~~But~~ I viewed from above the same differences appears in #29♀. The head is much ~~more~~ more compressed & is sharper

Osteology

When removing the skeletons I dissected the animals with great care & the following results are certainly correct

No 29♀

1. Boneis #no 29♀

Tooth formula $\frac{47-46}{47-46}$. Teeth set loosely in sockets & could be easily moved with the fingers; teeth curved slightly outward, & very sharp. The anterior ones of each jaw are exceedingly small & if they had not been counted in situ the formula would almost certainly be given as different because the very minute anterior ones would surely be lost by ordinary preparators. This would undoubtedly account for the discrepancies in the formulae given by True for this species.

Ribs 97 prs - the last 2 prs short & immovable c. c. "floating". Five prs. of ribs articulate to the sternum & two pass to the cartilage on its extreme lower end.

31 lumbar vertebrae.

15 dorsals ^{if} not counting the ones opposite the two floating pectorals. 12 of the lumbar

would be two less + the animals two more

No 27 ♂

T. borealis no. 27 ♂

42-44 ~~just~~ two teeth in mandible very
45-45 small. 17 p's of gills - the last 2
 p's floating.

30 lumbar vertebræ.

The first three chevrons are extremely small, the 4th increases in length abruptly, the 5th, & 6th increase regularly & the 7th & 8th are about of equal length. The 9th is slightly longer than the 8th & is the longest of the series; the remaining ones decrease gradually in height.

In no. 29 ♀ there were only two minute chevrons at the beginning of the series, thus increasing the lumbar units. It can pantie that the none of the small chevrons could have been overlooked.

T. borealis no 28 ♂ ;

45-44 The tips of the mandible & rostrum
45-? are broken

There are 30 lumbar - three minute first chevrons.

No 31 ♀

L. obliquidens no 31 ♀

13 p's of ribs - 5 articulate to sternum ^{not floating}
 22 lumbar

4 small anterior chevrons - the 8th is highest of series.

29-30 teeth 2 ant. teeth very small
 29-29 above & below.

no 30 ♂

S. obliquidens, no 30 ♂

13 pairs of ribs.

29 - 28 Undoubtedly the variation in
28 - 27 in the dental formulae
 for all members of the Dolphinidae
 is largely due to the presence or absence
 of the minute anterior & posterior teeth
 in both jaws. In most species
 these teeth are exceedingly minute and
 in some specimens, not present at
 all. In the majority of museum speci-
 mens they would be lost.

3 small anterior chevrons the 6th
 increasing abruptly in size - the 10th
 is the highest of the series

2, limbless

C	D	F	Ca
7	13	21	

no 28
(cont)

no 28 ♂ (cont) This was taken while phalanges
 all in situ.
 Phalanges (right pectoral) I II III IV V taking as first
 The terminal phalanges 1 7 6 3 2 ^{size the small}
^{one outside on} radius.
 of digits II & IV are circular - that of digit I is
 exceedingly minute. That of digit III is also
 very small. There are 6 carpalia -
 3 proximal row & 3 distal row.

No 27	σ	<u>Pursis borealis</u> (Peale)	June 12 1910	Aikawa mil.
Length straight snout to notch			= 2150	
" cover back "			= 2180	
Circum. of body opposite tip of first dorsal back		greatest	= 9510	
Snout to eye			= 330	
" " blowlake (center)			= 340	
" " corner of mouth			= 230	
" " post. mid. fin (pectoral)			= 690	
Tip lower jaw to corner of mouth			= 238	
Eye opening			= 23	
Notch of flukes to anus			= 530	
" " " penis			= 693	
" " " navel			= 875	
" " " post angle pectoral			= 1415	
Pectoral tip to post angle			= 215	
" " " ant. "			= 270	
" greatest breadth (at angle)			= 90	
Width part edge from base to angle			= 75	
" " " angle " tip			= 130	
" width at base			= 105	
Flukes tip to tip			= 350	
" greatest breadth ant - post			= 137	
Depth notch			= 20	
Length right lobe axially			= 200	
" left "			= 220	
Depth peduncle at ant. inst. flukes			= 83	
" between flukes & anus			= 116	
Distances tips of blowlake			= 29	
Length blowlake curved			= 42	
Length anal opening			= 35	
T " penis slit			= 130	

Dist. between ant. inst. fins below = 315.
 " " post. " " " = 345.
 Lower jaw beyond upper = 9
 Height of eye above line of mouth & center = 15.
 Length of back = 53
 " V. of " = 145.
 Girth head at eyes = 650.
 " body " ames = 412
 " " in front of fins = 885.
 Breadth of snout at base of V - over curve = 76

Dist. from corner to corner of mouth over head = 275.

Stomach contained many small fish
bares

measurements

no 28	<i>Tursio borealis</i> (Peale) ♂ June 12 / 10	Akawa
	Length straight snout to notch	= 1975.
"	over back "	= 2045.
\	Cir. of body off ante. fins laid back	= 885.
	Snout to eye	= 305.
	" " corner of mouth	= 204
	" " blowhole (center)	= 303
	" " post. large pectoral	= 617
	Length eye opening	= 22
	post. part dorsal	
	Notch flukes to ames	= 672
	" " " penis	= 650
	" " " navel	= 875.
	" " " front. inst. pectoral	= 1410
	Pectoral tip to post. inst.	= 197
	" " " ant. inst.	= 2513
	" greatest breadth (at angle)	= 85

Stomach contained many fish bones - the vertebrae would seem to indicate sardines.

Length post. edge pectoral from base to angle	= 60
" " " " " angle " tip	= 128
widest " at base	= 105
Length of beak	= 50
Height eye above line of mouth	= 10
Length V of beak (approximately)	= 100
Girth head at eyes	= 63.5
" body " anus	= 400
" " in front of fins	= 790
Dist. from corner to corner of mouth over head	= 260
Breadth snout at base of V (over curve)	= 75
Tip under part to corner of mouth	= 212
Flukes tip to tip	= 380
Greatest breadth flukes and post.	= 125
Depth notch of flukes	= 23
Length right lobe axially	= 227
" left " "	= 210
Depth peduncle at ant. inst. of flukes	= 89
" " between " " " + arms	= 125
Length across tips of hemiphares	= 32
" curved "	= 40
" anal opening	= 32
" penis slit	= 12.5
" navel "	= 15
Dist. between ant. inst. of fins below	= 288
" post. " " " "	= 330
Tip lower jaw to beginning of white banding on throat	= 393
Width of white band at banding behind finia	= 8
" " " " " narrow & between first naval	= 151
Length of whitish patch on tip of lower jaw	= 41.5

measurements

no 29	<i>Turio borealis</i> ♀ June 12/10 aikawa Japan	
	Length straight notch to flukes	= 2110
"	" " " over back	= 21751
Cir. of body opposite tip of fins laid back		= 1040
Snout to eye		= 3518
" " corner of mouth		= 2551
" " blowhole (center)		= 368
" " post. inst. of pectoral		= 7251
Tip lower jaw to corner of mouth		= 268
Length eye opening		= 22
Notch flukes to anus		= 5451
" " clitoris		= 625
" " mammary slit		= 600
" " " post. inst. pectoral		= 14510
Pectoral tip to post. inst.		= 212
" " " ant. "		= 280
" length base to angle post edge		= 751
" " angle " tip " "		= 140
" width at angle		= 90
" " " base		= 1151
Length of beak		= 751
Girth head at eyes		= 680
" body " anus		= 420
" " in front of fins		= 890
Corner to corner of mouth over head		= 2651
Breadth of snout at base of V (over curve)		= 63
Flukes tip to tip		= 402
" greatest breadth ant - post		= 148
" Depth notch		= 29
Length right side axially		= 238
" left " "		= 2251

stomach many small fish bones

Depth peduncle at flukes inst.	= 90
" .. between " & ames	= 185-
D int. between tips of blowholes	= 351
Length blowhole curved	= 41
" anal opening	= 10
" mouth "	= 19
D int. between " " "	= 37
Length genital slit	= 152
D int. between post. inst. fins below	= 410
" " ant " " "	= 341
Lower jaw beyond upper	= 151
" " to begin of white ^{branch} on throat	= 440
Width of white bands at branching behind fins	= 100
" " " " narrowest below " near " 52	
Length whitish patch on tip of lower jaw	= 96

Measurements

No 30	<u>L. obliquidens</u> ♂ June 12 110 Aitaura	
	Length straight nose to flukes	= 17551
	" over back " " "	= 1870
	Snout to eye	= 280
	" " corner of mouth	= 330
	" " blowhole (center)	= 300
	" " post. inst. pectoral	= 5184
	" " base of dorsal (posterior)	= 10151
	Eye to ear (anterior)	= 70
	" above "	= 9
	" opening	= 23
	Ear "	= 1
	Notch flukes to ames	= 4851
	" " " peris	= 6851
	" " " post inst. of dorsal	= 8510

Pectoral tip to post. nostril	= 240	115
" " ant.	= 320	
" greatest breadth "	= 105	
" * " at base	= 125	
nostril to post. nostril, pectoral	= 12510	
nostril flukes to mouth	= 933	
Height dorsal (vertical)	= 180	
Flukes tip to tip	= 4451	
" greatest breadth (ant. post.)	= 160	
" depth nostril	= 30	
" length right lobe axially	= 2651	
" " left " "	= 2651	
Depth peduncle at ant. most finbases	= 1951	
" " between " " ames	= 1851	
Length blackhole across tips	= 32	
" " curved	= 48	
Dist. between ant. most. of fins below	= 220	
" " post. " " "	= 2651	
Lower jaw beyond upper	= 51	
Length base of dorsal	= 2510	
" V lip side of head (approx.)	= 100	
Corner of mouth to ant. most. fin	= 240	
" " " center of eye	= 50	
Girth of head at eyes	= 670	
" " body in front of fins	= 925.	
" " " at ames	= 565.	
Dist. finbase corner to corner of mouth over head	= 360	
Height eye above line of mouth	= 251	
A scar on side half way above right fin - also one on lower lip in front of & under corner of mouth. Possibly a little more dark gray along anterior edge of dorsal than in No. 1 & - otherwise the same so far as coloration, etc., is concerned. The blackhole is drawn forward & downward to open it - no hair to be seen. Stomach empty.		

No. 31 ♀ L. obliquidens ♀ June 12/10 Akkawa Japan

Length straight = 1760

" over back = 1880

Snout to eye = 275"

" corner of mouth = 230

" blowhole (center) = 295"

" post. nostr. pectoral = 5.45-

" " " dorsal = 1092

Eye to ear (center) = 64

" above " = 8

" opening = 20

ear " = 1

Nostril fiber to anus = 5.33

" " clitoris = 3.98

" " mammae slit = 5.80

" " navel (sure) = 960

" " post nostr. dorsal = 520

" " " pectoral = 1283

Pectoral tip to post. nostr. = 243

" " ant. " = 315-

" greatest breadth (angle) = 100

" base " = 110

Height dorsal vertical = 180

Length of " bare = 2310

Flukes tip to tip = 440

" greatest breadth ant-post = 163

" depth notch = 33

" length right lobe axially = 260

" left " " " = 2651

Dip to peduncle at ant. nostr. of flukes = 1051.

" " between " " " " " = 1951

Length blowhole across tips = 26

" " curved = 42

Dist. apart of fins anteriorly below = 1951

" " " posteriorly " = 245-

Length anal opening = 131

" mammae " = 20

Dist. between " " " = 451

Lower jaw beyond upper = 7

Corner of mouth & ant. nostr. pectoral = 220

" " " center of eye = 510

Girth of head at eyes = 695"

" " body in front of fins = 8751

" " " at anus = 5160

Dist. from corner to corner of mouth over head = 390

Height of eye above line of mouth = 25"

In this specimen the beak is a little less distinct
& the line of the head is straight from the snout
to the head. That is, there is no "lip" in the outline
of the rostrum at the beak. Many small fish bones
in stomach.

no. 32

Phocena n. sp.? June 18/10 Aipawa

This porpoise was not seen by me until the 22nd having been killed four days. The station master had the entrails removed, by cutting down the median line of the belly. The ~~rest~~ ^{rest.} of the specimen remained intact until my return, when I photographed, measured & described it. I have compared the specimen point by point with True's figure of Phocena dalli published in his "Delphinidae" and find the following differences:

1. The white area on the sides of P. dalli begins anteriorly about opposite the anterior edge of the dorsal fin. In this specimen the white side area extends forward to a point slightly ~~backward~~ ^{beyond} ^{anterior} to the insertion of the pectoral fins.
2. In P. dalli the upper edge of the white area is almost on a line from the corner of the mouth to the flicker. In this specimen, the upper edge of the white area is considerably above such a line.
3. In our specimen the lower edge of the peduncle, just anterior to the flicker inserted there is a patch of gray marked with short horizontal black lines. This

patch is distinct. P. dalli presents no such coloration.

4. The outline of the posterior half of the body of our specimen is totally unlike that of P. dalli, & in fact is unlike that of any other porpoise with which I am familiar.

The upper & lower edges of the peduncle are not ~~particularly~~ flange like as in P. dalli. The edges are sharp above but not below. They ~~are~~ ^{then} gradually to the upper edge.

The body is apparently thicker than in P. dalli.

Description

Color entire Head, back & upper sides black. A white area occupies the lower sides, ~~posterior breast except ventrally~~ ~~breast~~ & belly. This white area extends forward to a point slightly beyond the anterior insertion of the pectoral fins. In the central part of the body the superior edge of the white area is almost straight, anteriorly the end is rounded, the lower ~~anterior~~ ^{not reaching} edge extending back & down obliquely, running on to the breast ~~by~~ a little behind the posterior insertion of the fins. Posteriorly, between the fins the black of the throat extends backward in a ~~the~~ narrow band on the mid-

ventral line of the breast, to a point ending
 2/0 mm behind the first nostril. 7 fm.
 The rest of the belly ~~is~~, breast & belly white.
 Posteriorly the white side area ends in a
 lanceolate-shaped band on either side, the
 black of the peduncle encroaching
 on the mid ventral line running for-
^{& ending}
 ward ~~but~~ ^{way} ~~near~~ ^{between arms & pectoral}
~~beyond~~ ^{edges of the} ~~area~~ ^{line}
 The lower half of the peduncle ~~is~~
 a space just in front of the fleshier
 insertion is occupied by a grayish
 patch thickly marked by short, parallel
 black lines. On the ventral edge of
 the peduncle this area is 200 mm.
 long

Flukes The anterior ~~to~~ edge of each lobe is
 slightly convex; considerably so at tip.
 The post. edge is ~~almost~~ very slightly
 concave. The tips are not sharp. The
 notch is deep & open.
 The flesh below are black except
 for a whitish band which runs from
~~the~~ ^{on} each side of the notch along the
~~post edge~~ obliquely across the each
 lobe to ~~the~~ ^{area} meeting the anterior
 edge 200 mm from the tip.
 Below colored the same.

Fins Black above & below except for a small
 area of grayish, faintly marked at the angle

on the post. edge. Ant. edge of fin strongly convex; post. edge concave, but the angle is rounded & not sharp.

~~Dorsal triangular cleft~~ tip ~~which~~ is slightly recurved. Dorsal ~~margin~~ ^{slightly} ~~lanceolate~~ ^{sharp}. After half whitish marked with a few scattering short black, parallel lines. Entire post edge dark. 14 small tubercles along ant. tip of fin. The dorsal is thin.

Peduncle The outline of the peduncle presents the most remarkable character about this porpoise. From the dorsal fin to a point 300 mil. anterior to flukes insertion the upper edge is almost parallel with the axis of the body; at that point, it drops ^{more abruptly than} ~~sharply~~ down to the flukes.

This upper edge is thin & sharp.

The lower edge of the peduncle presents a prominent rounded "bulge", ~~which~~ begins immediately behind anus & ending 220 mil. ante flukes insertion.

This peculiar shape to the peduncle gives the animal a "chubby" appearance

The lower jaw projects slightly beyond upper & is blunt. The head is blunt, narrowing rapidly from the eyes to the snout, ~~describing~~ ^{& sharp} to 2

Osteology of Phocaena no 32

I dissected the specimen with extreme care & there is no possibility that the following results are not absolutely correct.

There are 17 prs. of ribs - the next to the last rib on each side is long but is attached to the transverse process of the vertebrae. The last pair of ribs are short & "floating" & might easily be overlooked. ~~If~~ There are twenty-six lumbar vertebrae if the vertebra opposite to the pair of floating ribs is counted as a lumbar. ~~If it is~~ counted as a dorsal, the number of lumbar will be twenty-five.

C	D	*	F	Ca
7	16 or 17		26 or 25	46 = 95

~~There are~~ There are 35 chevrons in the entire series. The two or three small chevrons at the beginning of the series commonly present in porpoises are absent in this specimen.

The first chevron is long but free distally. The laminae of the 2nd are very broad & the spine is pointed distally. It is slightly longer than the first.

The 3rd is of about the same width as the first but is larger than the 2nd.

The ~~spines of the~~ 4th & 5th are very narrow

and are somewhat longer than the 3rd. The 6th is slightly wider & longer than the 5th. The 7th is longer & broader than the 6th & the 8th is the longest of the series. From this back they decrease gradually in length & increase very gradually in breadth. These observations are of the chevrons in situ - whether or not the actual measured length would correspond with this or not I can't tell until they are cleaned. The 8th is however, the highest or largest as the series stand in position. The anterior ^{chevrons} ~~teeth~~ of the series are directed backward & permit of considerable antero-posterior movement.

The 2nd & 15th chevrons are about equal in height as they stand in position. ~~but~~

The last chevron is exceedingly minute but is ossified - 1

The last two caudals very small all teeth very small

Teeth

19-19 Posterior teeth in both jaws
 22-22 exceedingly minute so not
 show above the gills altho' the alveoli
 are distinct pits in which the teeth may
 be found. ~~the~~

Measurements of *Phocaena* no 32

Total length straight from snout to notch = 1915.
.. .. over back (over the curve of peduncle) 2115.

Snout to eye	= 233
" " corner of mouth	= 1251
" " blowhole (center)	= 250
" " post. ^{inversion} costa pectoral	= 4151
" " dorsal	= 1110

Tip lower jaw to eye	= 283
" " .. " ant. edge blepharole	= 260
" " .. " corner of mouth	= 134
" " .. " ant. base pectoral	= 3051

Eye to blowhole ventral = 168
Tip lower jaw to ant. boundary white area on sides = 310

Tip lower jaw to ant. boundary white area on side = 310
Blow hole to ant. edge base of dorsal = 505.

Tip bone goes to penis = 1235.

Length white area along mid ventral line = 7.85 -
5.35 -

Depth body 24 inches anterior to flukes (over curve of body) - 3135 - 170

" " 8 " " " " = 270

Length eye opening = 22

✓ notch of flukes to anus = 6.20

" " " " penis = 7651

" " " " " fort. bare daniel = 1010

" " " " " " pertoral = 1880

Prestoral tip to lead businesses = 220

v " " " *" part. nisertensis* 163

" " ant. " 233

265
" " ant. " " 1915

"base" : 103

v Height dorsal vertebrae = 165.

Length base dorsal	= 360
Flukes tip to tip	= 469
Ant. post. breadth pectorals (greatest)	= 180
Depth notch	= 30
Length right lobe axially	= 251
" left " "	= 245.
Depth peduncle at ant. inst. of flukes	= 106
" " midway between " " "	
and anus (which is where upper edge of gills & slope down):	304
Depth peduncle at lower protuberance	= 373
Length blowhole across tips	= 49
" " curved	= 57
Dist. of first of fins anteriorly below	= 157
" " " " posteriorly "	= 203
Length anal opening	= 13
Lower jaw extends beyond upper	= 7
Dist. from corner to corner of mouth over head	= 270.
Girth of head at eyes	= 685.
" " " in front of pectorals	= 835.
" " body at post. insertion of dorsal	= 1285.
" " " " anus	= 817
Corner of mouth to ant. inst. of fins	= 210
Dist. of eye above line of mouth	= 20
Length white area on sides (ant-post.)	= 1175
Dorsal fin begins 25 mm. behind the junction of the 1st & 2nd thirds of total total length (measured along side)	

No 18

Lagenorhynchus obliquidens 3 June 1910 Akaia Japan

This specimen was harpooned from the w/s "Taihei Maru No 2" about 50 miles from Akbarwa. The animal was taken on the deck of the ship and lived for about three hours, finally dying from loss of blood. While alive I studied it carefully taking all color notes immediately, and also taking a circumference measurement. The animal "blew" every few seconds opening the blowhole widely, at them appearing as ~~as~~ ^{as} a circular opening. This was accomplished by drawing the points between the points of the blowhole downward & forward. No vapour was visible when the animal ~~seeped~~ blew probably because of the frequency of the respirations. The eye ~~was always~~ closed when the finger or any other object approached it, and the ~~sight~~ sight seemed fairly good. While the animal was alive it frequently raised its head & posterior part of the body from the deck with a convulsive motion. Also it closed its jaws sharply upon a stick when it was placed in its mouth. It seemed to have considerable biting power & I imagine could produce rather a severe wound.

On the same day that this specimen was secured a number of others were

seen in schools of five or six. They skinned along the surface frequently, but did not leap entirely out of the water as I have seen D. delphinis do so ~~often~~. On the day following the capture, I saw several more schools of the same species. The gunners tell me that they see this porpoise frequently and it would seem to be abundant. P. boyali's has also been reported as abundant by the gunners.

color

~~Off~~ ~~on each side~~ A line of dark gray, 10 mil. wide runs from the corner of the mouth in a ^{slight} curve down to the anterior insertion of the ~~base~~ pectoral fin. It begins again at the base of the fin above, 40 mil. from the posterior insertion, curves slightly upward and then downward, upward again in a long sweep, & finally downward curving off the peduncle 50 mil. behind the anus. The ~~line~~ comes down furthest on to the belly 160 mil. from the post. insertion of the fin.

All the throat, breast & belly below the line ~~is~~^{a point off side} white. On the sides from the middle of the dorsal fin to beyond the eye is a roughly elliptical area of light gray, its lower edge bounded by the dark gray line which separates it from the ventral white area. This elliptical light gray area is 180 mil wide in vertical diameter at its widest point. It is prolonged forward along the ~~upper edge of the~~ V shaped crease on the ~~snout~~, and shades gradually into the dark gray of the rostrum. The eye is situated in a ~~oval-shaped~~ area of darker gray, the anterior end ~~of which is~~ prolonged considerably forward. The edge of the rostrum for a distance of 70 mil. from the point of the V is washed with gray. The rest of the head & the back is very dark gray. Opposite the posterior insertion of the dorsal fin the dark gray of the back runs down to meet the white of the belly in a band 210 mil wide. This dark gray ~~back~~ band divides the light gray area on the sides of the anterior portion of the body from ~~an similar area~~ color on the lower half of the peduncle which extends back to the flukes. The median keel of the flukes is also light gray. The upper corner of this light gray

peduncle area is prolonged forward in a rapidly narrowing ~~base~~ streak of gray which reaches a point ~~near~~ the back nearly opposite the posterior insertion of the pectoral fin. Opposite the base of the dorsal this gray band is 110 mil. wide.

The edge of the lower lip is dark gray which widens abruptly into a cap of dark gray 38 mil. long at the mandibular symphysis.

Pectorals Above; The anterior half of the pectoral fins for the entire length is dark gray, which shades into a ~~little~~ lighter gray of the posterior half. The whole tip of the fin is inclined to be a little lighter shade even along the anterior edge...

Below, the fins are like the superior surface except that the entire base is lighter.

The angle of the posterior edge is sharp & prominent.

Dorsal Has anterior ~~edge~~ ^{surface} dark gray; at the base this dark gray edging is 80 mil. wide but narrows rapidly toward the tip until it is only 15 mil wide. The remainder of the sides and the tip of the dorsal is like the light gray of the sides of the body.

Flukes Above & below dark gray.

As I have remarked ~~this~~ description was written while the animal was

yet alive. A short time after death the colors had begun to change; the dark gray of the back had become black and the light gray of the sides of the body was much darker. In consequence of these changes the contrast between the light & dark colors does not show in the photographs in its real value. The ~~adult~~^{polypoid} is a really beautiful animal when seen while retaining its natural colors.

External
notes

The tip of the fin laid back is exactly opposite the anterior ^{margins} edge of the dorsal — this is the point of greatest girth.

There were no evidences of hair upon the body or head.

The stomach was empty —

The center of the eye directly below the blowhole — the blowhole is not quite regularly semicircular.

The superior outline of the peduncle from the dorsal to a point 330 mm. from the notch of the pectorals is almost a straight line; it then rises slightly (about 10 mm.) & slants ~~up~~ gradually down to the pectorals, its ridge becoming lost half way across its surface. The upper edge of the peduncle is rounded ~~but~~ near the dorsal but gets gradually sharper

where its outline begins to rise until it is very sharp at the anterior insertion of the pectorals. The posterior edge of the dorsal is very thin - the ant. edge not so.

There is a slight bulge ~~near~~ the outline of the head, at the eye.

The ~~V~~ of the neck is shallow & does not meet in front, it is 90 mil. long on the left side & is lost 100 mil. from the corner of the mouth.

@ osteology

Scapula lies at an angle - the ant. end is tipped slightly upward - glenoid fossa is in an almost parallel line with body axis - acromion points inward

13 pairs of ribs

5 - " " " articulates to sternum

25 - 26 dental formula
26 - 26

Measurements of No. 18

taken while animal was alive.

Total length snout to notch straight	= 1710 mil.
" " " over back	= 1810
Alt. of body opp. tip of first laid back (greatest)	= 1000
Snout to eye center	= 275
" " Ear	= 335
" " Blowlip (center)	= 295
" " post. inst. pectoral	= 535
" " " dorsal	= 1020
Eye to ear center	= 64
" above " "	= 8

Tip of lower jaw to corner of mouth = 235
corner of mouth to ant. most. dorsal = 210
center of "blowhole" to center of eye = 510
center of blowhole to center of eye = 170

131

Length eye opening	= 22
" ear "	= 1
Notch flukes to anus	= 490
" " " penis slit (center)	= 663
" " " navel (not certainly located)	= 905?
" " " post. most. dorsal	= 780
" " " " pectoral	= 1200
Pectoral tip to head barbules (left)	= 320
" " " post. most.	= 284
" " " ant. "	= 315
" greatest breadth (at angle)	= 102
" " " base,	= 110
" distance between ant. of insertions below	= 210
" " " post. "	= 250
Height dorsal vertical	= 153
" " axial	= 240
Length " base stumps	= 230
Flukes tip to tip	= 432
" greatest breadth (anis-post.)	= 155
" depth notch	= 30
Length right lobe axially	= 277
" left " "	= 279
Greatest thickness flukes at insertion	= 35
Depth peduncle at ant. most. of flukes	= 105
" ^{midway} eleven " " " + anus = 180	
Length across tips of flukes	= 25
" " " curved	= 40
" anal opening	= 20
" penis slit	= 105

No 40 Globicephalus Scammoni Cope, ♂ June 26 / 10 Rikans

This specimen, an adult male, was taken by ~~by~~ the ship "Taipei Maru No. 2" Capt. Samuelson, gunner, on June 26th. It was measured by me the same evening & photographed & described the following morning. I had been expecting this ~~for~~ a specimen of this species for Capt. Olsen of the "Rekken Maru" had told me that he saw several schools the day before & had fired at one.

I compared Scammon's figure with this specimen before it was finished and noted the corrections on the plate. In his figure the superior outline of the body is almost a straight line, & this is far from being the case in my specimen. The eye in his figure is not correctly placed - it is ~~off~~ directly above the corner of the mouth. In my specimen the eye is above & considerably behind the mouth corner.

In Scammon's figure the throat is much too full; there is also a rather abrupt dip in the outline of the ~~body~~ ^{at the same time} in my specimen which is not shown in his figure. The base of the dorsal in Scammon's figure is much too short. The pectoral fins are also

placed too high on the side. The color of Scammon's specimen is given as "entirely black" - this is not the ~~same~~ case in my individual. Its color is as follows -

Color

The color of the entire upper parts is black with the exception of an area immediately behind the dorsal fin which is light gray. This gray area has roughly the shape of a ~~parallelogram~~, its apex directed ~~backward~~ toward the flukes and its ^{central} longitudinal axis being the ridge of the back. The edges of this light area grade imperceptably into the black of the back, excepting at the ~~posterior~~ where the transition is more abrupt. The ant. part. length of this gray area is 600 mil. Its furthest downward extension transversely from the ridge of the back is 200 mil. on either side. There is a small dash of gray 60 mil. long by 10 mil. wide, just below the ant. insertion of the flukes on the left side only. The dorsal fin is faintly tinged with grayish - almost imperceptable. The lower parts are black except as follows: From the navel a ~~for~~ very narrow, purplish-gray line, starting as nothing, runs ~~out~~ on the exact

center of the ventral surface, becoming gradually wider as it goes forward until slightly beyond the anterior insertion of the pectorals it spreads out into a fountain shaped purplish gray area. The anterior end of this area is notched in the center, & has rounded corners. It is $\frac{1}{4}$ 20 mil. ~~wide~~

from the tip of the under jaw. ($\frac{1}{4}$ 20 mil ^{is} behind line of corners of mouth)

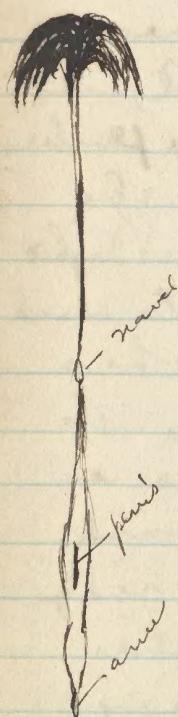
Directly between the pectorals before the line spreads out, it is 16 mil. wide. The purplish gray area from the navel to its anterior end is 168 cent. long.

From the navel ~~backward~~ a less clearly defined, but wider, purplish gray ~~area~~ extends, backward broadening gradually until at penis it is 140 mil wide, & then narrows a little between penis & anus, then widens again slightly, & runs abruptly into the anal opening & is lost.

There is no indication of lighter color on the ventral surface behind the arms except the spot below the gular insertion already referred to.

The outer layer of the epidermis is as thick as that of a megaptera.

shape of ventral
gray area



Epidermis

Peduncle

The outline of the peduncle is very unlike that shown in Scammon's figure instead of having the superior outline nearly straight until a short distance anterior to the flukes it is as follows.

From the posterior edge of the dorsal there is a gradual slope downward to a point opposite the penis - then there is a gradual rise until at a point midway between the flukes insertion & the anus the curve reaches its greatest height; here the peduncle is deepest. From this point, the slope to the flukes is gradual & not abrupt as in Scammon's figure.

The lower outline of the body is as follows: - From the tip of the lower jaw to the penis the outline of the breast & belly is a regularly convex line but not as strongly convex on the throat as is shown in Scammon's figure. There is a sharp dip between the penis & the anus; the peduncle swells out a little directly behind this & then slopes gradually to flukes. The point of greatest swelling of the lower edge is a little anterior to ~~that~~ the greatest

curve referred to the upper edge

Flukes

Have the anterior edges regularly convex - the post. edges very slightly concave. notch deep. Black above & below. The posterior edge of flukes very sharp

Dorsal

Is situated on a long base. It is thick & heavy. The post. edge of the dorsal is 5-2 cm. anterior to the middle of the body. The first is 2 cm. behind the axilla.

Pectorals

^{Garrowt} Are strongly pectinate & tips pointed. The angle of the posterior edge is 140 mil. from the axilla. The length of the fin is contained a little more than five times in the length of the body over the curve of the side. { ^{The distal half of fins (except tips)} have on the anterior edge a row of small hard spines.

Blowhole

Is situated in a decided depression; it has the characteristic shape among the Delphinidae - a not quite regular semicircle.

The top of the head from blowhole to dorsal is flat.

Navel

The navel is directly opposite the tip of the dorsal fin.

Head

The head is ^{& back} globous, large, the extremity overhanging the snout. The "beak" is short rounded & not prominent. It is formed by a slight constriction on the sides and a depression in front.

Thickness of body

The greatest thickness (depth) of body is at a point a little behind the anterior insertion of the dorsal fin.

© Stenogly no 40 ♂

Vertebral formula:

Vertebral C D S Ca The last caudal is
 7 11 13 28 = 59 about the size of a
 small pea - The dissections were made
 with great care & these results are certainly
 correct

Ribs 16 prs. none floating
Chevrons 19 chevrons in series - the last is very small
 The first pair of chevrons are very small
 and the laminae are far apart distally - the
 2nd is larger & longer but still well separated
 distally - the 3rd is same height as 2nd but
 the laminae touch distally; they are not
 joined by ossification however. The 4th.
 is same height as 3rd but are joined dist-
 ally by ossification - the 5th is higher than
 4th. It has a longer spine. The 6th is higher
 than 5th & has shorter laminae but longer
 & narrower spine. The 7th is same height
 as 6th but the spine is wider. The 6th & 7th
 are highest of series; from this point back,
 the spines widen ~~up~~ & decrease in height
 gradually. The last chevron is exceedingly
 small but is ossified.

These observations were made while the series
 were in situ, & do not mean the actual
measured lengths of the chevrons.

Dental $\frac{8-8}{8-8}$
formula

Measurements of <u>G. escommomi</u> Cope	
Length straight notch to extremity of head	= 4940
" over back "	= 5000
Snout to eye	= 530
" " blowhole (over front of head)	= 890
" " base of dorsal (posterior)	= 2040
" " ant. nostr. " over side	= 1560
" " " " pectoral "	= 780
" " corner of mouth	= 400
Extremity of head to eye (straight)	= 490
" " " " ant. base dorsal	= 1840
" " " " post. " pectoral (over side)	= 1170
Dist. from eye to ear (center)	= 170
" Eye above ear	= 50
Length eye opening	= 36
" ear "	= 1
Eye above corner of mouth	= 90
" to " " " straight	= 120
Post. nostr. fin to " "	= 720
Eye to center of blowhole	= 500
Blowhole to post. nostr. dorsal	= 1480
Tip under jaw to ant. nostr. pectoral	= 730
Girth of body at anus	= 1770
" " " " insertion of flukes	= 610
" " " " ant. " " dorsal	= 2540
" " " " " " pectorals	= 2180
" " " " post " " dorsal	= 2320
" " head " eyes	= 2010
" " " " corners of mouth	= 1900
Notch of flukes to anus	= 1700

mil.

notch of flukes to penis (center)	= 2180
" " " navel "	= 2960
" " " post. most. dorsal (straight)	= 2960
" " " " " pectoral	= 3960 ?
Length pectoral tip to head of ^{humerus} pectoral straight	= 1060
" " " post insertion "	= 8051
" " " ant. "	= 1030
" " post. edge along curve	= 8551
" " ant. " " "	= 1130
Breadth " base	= 2951
" " at angle	= 300
Height dorsal vertical	= 2781
Length " base	= 690
Length pectoral axially	= 1020
Flukes tip to tip	= 1180
" greatest breadth anti-post.	= 350
" depth notch	= 63
" length right lobe axially	= 6151
" " left " "	= 600
" greatest thickness at insertion	= 751
Depth peduncle at flukes insertion	= 310
" midway between arms & "	= 720
Length blowlip across tips	= 951
" " curved	= 1251
Dist. apart of fins below posteriorly	= 500
" " " " " anteriorly	= 470
Length anal crease	= 2351
" navel "	= 40
" penis "	= 4651
Upper jaw extends beyond lower	= 30

No 49 Sword Fish July 19/10 Aikawa

I did not see this fish until two days after it had been killed; at this time the color is as follows:-

Color Back & upper sides dark purplish brown shading into light brown on the sides & belly. Mandible and throat purplish silver. Abdomen from ventral fin to ^{tail} ~~flanks~~ purplish silver.

Measurements in mil.

Total length center of tail to tips of "sword" = 2950

Tip of sword (sword) to eye = 100 (center of eye)

.....

" anal. insert. of first dorsal: 1310

W. W. W.

" " " 2nd " = 2560
" " " first ventral = 2060

11-11-11 Second r 3245

" " " pectoral = 1380

卷之三

$$0.11 \quad 0.11 \quad n = 480$$

corner of mouth = 23°

Height first dorsal (median) : 37.5

presently in " at base: 420

Height 2nd dorsal = 80

$$1 \quad " \quad \text{pectoral} = 35^{\circ}4$$

Breadth " at base = 89

Height first ventral: 235

Breadth base first ventral = 25°

Height 2nd ventral: 69

Tail tip to tip = 700

Length upper tube axially = 5510

" lower " " = 505

Dist from center of tail to center of ~~base~~ ^{Caudal} flange = 280

Length base of caudal flange = 200

No. 50 Lagenorhynchus obliquidens Gill. July 19/10 Akam.

This specimen had been killed two days before it examined it, but it was in good condition.

Color

In general the color description of no 18 applies to this specimen, ^{except in} the following points.

The anterior prolongations of the light gray ~~area~~ ^{on the side of the head} areas from the eyes forward, are wider and lighter than in no 18. ~~The light~~ ^{These} ~~line~~ meet in the middle ~~of the line~~ ~~front~~ in front but become a little darker just at the middle line. The back below the V is all dark gray - the ~~other~~ ^{on the side of the nostrum} light gray ~~area~~ ^{is all above the} V.

The dark gray line which divides the white ventral, from the gray side, areas is a little wider ~~than~~ behind the pectorals than in no 18. Also 140 mil. from the post. insertion of the fin there is a sharp angular projection of the gray line downward into the white of the ventral parts. This was not found on any of the other specimens.

The light gray area on the sides & behind the dorsal covers the entire sides & all but the back. In no 18 it only covered the lower half of the peduncle. Just anterior to the pectoral uncertain the ~~tiny~~ dorsal

ridge is also gray.

The dark gray ^{on the} anterior side of the dorsal is wider than in no. 16. That is, the light gray only covers the posterior half of the fin & the anterior half is dark gray.

The upper corners of the light gray peduncle areas are prolonged forward in ^{two} narrow parallel bands ~~one~~ to the back & forward almost to the blowholes.

External characters

The tip of the pectoral laid back is ~~not~~ does not quite reach to a line drawn down from the ante. insertion of the dorsal. In no. 18 it does.

The ante. commissure of the eye is ~~slightly~~ behind the center of the blowhole. In no. 18 the center of the eye is below the blowhole.

The stomach was empty.

Measurements

	mil.
Total length snout to nozzle of pharynx straight	2090
" " " " " over back	2250
Snout to eye	= 300
" " corner of mouth	= 254
" " blowhole (center)	= 310
" post. inst. of pectoral	= 610
" " " " dorsal	= 1245
Tip of mandible to corner of mouth	= 262
Corner of mouth to ^{center of eye} ante. inst. of dorsal	= 551
Center of blowhole to " " "	= 187

Corner of mouth to ant. most pectoral	= 235
Height eye above line of mouth (cent. of eye)	= 25
Dist. from corner to corner of mouth over head	= 407
Length beak from apex of r to tip of snout	= 54
Breadth " at " " (over curve)	= 106
Blowhole to ant. most. dorsal	= 645
Girth of head at eyes	= 765
" " body in front of fin	= 1010
" " " at anus	= 670
Length eye opening	= 25
Notch flukes to anus	= 608
" " " clitoris	= 676
" " " mammary slit (center)	= 663
" " " navel (certain)	= 1134
" " " post. most. dorsal	= 1000
" " " " " pectoral	= 1540
Pectoral tips to head humerus	= 350
" " " post. insertion	= 249
" " " ant. "	= 330
" breadth at angle	= 112
" " " base	= 120
Height dorsal vertical	= 165
" " axial	= 265
Length " base	= 290
Flukes tip to tip	= 520
" greatest breadth ant. post.	= 185
Length right lobe dorsally	= 307
" left " "	= 304
Thickness flukes at insertion	= 110

Depth notch of flukes	= 35-
Depth peduncle at " insertion"	= 110
" " between notch & arms (midway)	: 207
Length blowhole straight across tips	= 29
" " curved	= 36
Dist. between pectoral fins below anteriorly	: 244
" " " " posteriorly	: 277
Length anal opening	= 9
Length entire mammary slit	: 15
Lower jaw projects beyond upper	= 9
© Stebbins No 50	
Rules - 14 prs attached & 1 pr unattached, the latter being only about 2 inches long	
Dental formula	$\frac{30-30}{29-27}$

Vertebral formula

C	D	L	Ca
7	14 (or 15)	19 (or 18)	37 = 77

Chevrons 29

The first chevron has only the small laminae of the right side present.

The chevrons of the next four vertebrae are ankylosed into a solid bar, the laminae of both sides being present.

The chevron of 6th caudal has only the right laminae present - that of 7th caudal consists only of left laminae.

The chevrons of the 8th & 9th caudals have the laminae erected ~~by~~ distally.

but no spine - the 10th chevron has a short spine; the chevrons of 13th caudal is highest of series as they stand in position.

There are 29 chevrons counting those of subcylindrical bar as four.

Go Hagei Maru ~~3200 ft.~~

No. 46 Sperm ♂ July 14/10 Aikawa Japan
Color slate - A gray (light) semicircular
 patch covering about umbilicus.
 & the side directly above washed
 with grayish.

Length from tip of nose to extremity of head by cutters = 45'
 + flukes to hump (dorsal) = 53.5 cent.
 Fin tip to post. nict. = 95 "
 " " " apert. " = 140 "
 Height between = 25 "
 Flukes breadth ant. post. = 105 "

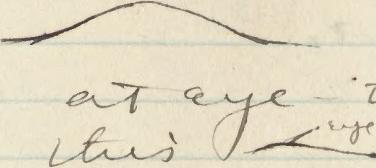
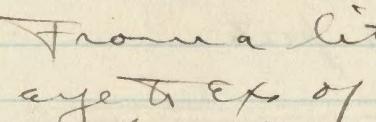
Length from tip of nose to extremity of head by cutters = 45'	
+ flukes to hump (dorsal)	= 53.5 cent.
Fin tip to post. nict.	= 95 "
" " " apert. "	= 140 "
Height between	= 25 "
Flukes breadth ant. post.	= 105 "

"Go Hagei"

No. 47 Sperm ♂ July 14/10 Aikawa
Color This whale was drawn out upon
 the slip & measured carefully.
 General color slate. Just in front
 of the umbilicus is a semicircle
 of gray (light), the convexity backward.
 That is, the mark curves backward
 from the nose on the sides.

(The same mark ~~on~~ same position
 in the Van. de. specimen) A few light
 gray dashes along upper edge of
 peduncle & just below eye on the
 side of the head. The upper half of
 the lower jaw is white - the upper
 lip is white marked with dark spots.

External characters There is a marked dip just behind
 the head in the outline of the back.

The top of head is straight, then the dip at base of shell in back outline - there are four small & irregular humps behind "hump" on dorsal ridge. Hump like this  There is a prominent swelling on the head at eye - the outline is like this 

From a little below line from eye to tip of head the lower half of head (or upper jaw) is wedge-shaped.
 Roughly this is shape of cross section of head at extremity.



On the throat from the beginning of the branching of the mandibular rami to a little behind corner of mouth there are 50 short creases; 5 on either of the median throat ridge; the longest of these is 60 cent. width of gape narrow & deep.

The were a few fresh, deep, "cups" evidently left by parasitic cirripeds

(measurements see opposite page)

Measurements of No. 47 ♂	
total length notch of flukes to extreme of head	= 145.5
ext. of head to eye (st.)	= 3.80
" " " post. inst. blowhole	= 5.45.
" " " corner of mouth	= 3.25.
Tip of mandible to " "	= 2.26
ext. of head to "dip" in back outline at base of snout	= 5.35.
notch flukes to anus	= 46.5.
" " " penis (center)	= 6.35.
" " " navel	= 7.65.
" " " center of dorsal "bump"	= 5.90
Pectoral tips to head bony process	= 14.51
" " " post. inst. ? (should locate)	= 9.51
" " " ant. "	= 1.30
" greatest breadth	= 7.51
High of "bump" vertical	= 3.51
Greatest breadth flukes (ant. post.)	= 11.3
Depth femur at ant. flukes inserted	= 9.0
Length blowhole (st.)	= 6.0
" " " curved (photographed)	= 6.8
Anus to penis center	= 17.0
" " " navel	= 3.00
ext. of head to tip of under jaw	= 9.0

"go Hogen"

No 48 Sperm ♂ July 14/10 Akawa Japan
Drawn out after slip & measured
carefully.

Color General color slate - same light gray
as dark markings about genitalia
as in others.

External characters A slight dip at base of head - a slight
concavity in head outline;
Meat very dark red. Blubber
yellowish white

Measurements

Total length ex. of head to notch	= 189.51
Ex. of head to eye	= 37.51
" " ear	= 41.5
" " post. inst. pectoral	= 52.51
" " corner of mouth	= 31.7
Tip mandible to " " "	= 22.2
Eye to ear	= 4.6
" above "	= 1.8
" opening	= 7
Ear "	= 9
Notch flukes to anus	= 40.5
" " " penis (center)	= 57.2
" " " dorsal hump (center)	= 5.80
Breadth flukes (anti-post.)	= 1.04
Depth peduncle at flukes inst.	= 8.5
Length blowhole (st.)	= 41
" " axially	= 48
Anus to center of penis	= 16.7
Depth notch of flukes	= 31

3.30 G. W.

No 52

Sperm ♂ July 23/10 Aikawa
(Skeleton taken)Whale drawn out on slip & measured
carefully.

Color

General ~~dark~~ color slate. Much
light gray about genitalia and
on the sides directly above a far
as mid ^{Lateral} ~~ventral~~ line.

Flecks & dashes of light gray along
ventral line almost to flukes.
Small scattered patches & flecks
of light gray over ~~dark~~ breast
clear to corner of mouth.

The extremity of the head (the lower two
thirds) is white; the upper third
is very light grayish which shades
gradually into the white of the lower
two thirds. On the sides of the
head from the extremity to the
corner of the mouth ~~dark~~ it is very
light gray "cross-crowed" in every
direction with white lines and
narrow bands.

The whole mandible from a point
anterior to the branching of the
ramii is white marked rather
faintly with small oblong grayish
marks pointing fore and aft
From a point a little behind
the corners of the mouth to the
branching of the mandibular ramii

(that is the area occupied by the throat creases) the color is mixed gray & white, "pepper + salt."

The color of the body changed very quickly from slate to brownish black when the animal was drawn out of the water.

External characters There are a great number of short shallow creases on throat between the ~~hair~~ of the maneable & to a point a little beyond the corners of the mouth.

At base of skull where the head was disarticulated from the vertebral column, the head was 9 ft 6 inches in diameter, ~~including blubber~~ including blubber.

The entire epidermal layers pull off very easily - the outer one is almost as thin as that of a blue whale.

The "wrinkles" of blubber extend forward as far as a point opposite the eye, but only on top of head.

Just behind corner of mouth blubber is 36 cent. thick - this is thickest place in head.

Blubber white, with a yellowish

tinge.

The bump behind anus is prominent

The hump is high & sloped like this

Fishes

Above & below slate with no markings. The outline of posterior is strongly & regularly convex. The anal edge is but slightly convex.

Teeth

23. In the upper jaw there
18-19 were 24 teeth all but four
of which (2 on each side) were embed-
ded in the gum & could only be
found by cutting into it. The
teeth that were visible circ about
the middle of the jaw.

Very small in comparison with
those of a Blue, Finback or
Humpback.

Head

The blubber is comparatively thin,
next comes a layer about 6 in. thick
of large tendons (about an inch in
dia.) running fore & aft. Below
this is ~~the~~ a second thick layer of
fat thickly run thru' with small
fibrous bundles. next comes the
spermatic case which contains
blood in a more or less liquid

Heart Lung

condition - it is probably ^{almost} wholly
liquid at life. Below the case
is much spermaceti run
thru with small & transverse
fibres with near & then a large
thick ridge.

~~Osteology~~

10 fms of ribs

Vertebræ

Measurements

Total length ex. of head to notch over back	59 1/2
Ex. of head to eye	= 580
notch flukes to anus	= 466
" " " penis	= 656
" " " navel	= 756
" " " cent of dorsal hump	= 650
" " " post. dist. pectoral	= 1015
Pectoral tip to head humerus	= 168
" " " post. insert. (?)	= 114
" " " ant. "	= 148
" greatest breadth	= 78
Height hump vertical	= 60
Flukes tip to tip	= 450
" greatest ant. post. breadth	= 157
" depth notch	= 45
Length right lobe axially	= 230
" left " "	= 240
Thickness flukes at insertion	= 30
anus to penis	= 190
" " navel	= 290

<u>no 5-3</u>	Finback ♀ July 24/10 Aikawa	
	a dark whale.	^{in feet}
	Total length snout to notch along side =	45' 6"
	Flukes to post. nict. pectoral	= 45'
	" " dorsal (post.)	= 15'-5"
	Snout to eye	= 14'-6"
	These measurements were taken by myself with the cutter's line	

no 5-4 Finback ♀. July 25/10 Aikawa
 A rather dark whale. Behind the arms
 the gray of the sides covers all but a
 very narrow strip on the ventral
 edge of the peduncle. (it comes down
 further than usual on the sides).
 The white ventral line in its widest
 place behind the arms is only
 8" wide. The points extending
 toward arms are well marked.
 Where the gray portions of the sides
 of throat & breast shade into the
 white ventral region, they had
 turned to a light sepia by the time
 it was brought to the station having
 been in the sun for a considerable
 time. I have seen the same thing
 present in many other Finbacks
 where they had been for some hours
 in a strong sun. This will explain

why one European author described the color of Balaenoptera physalus as shading the dark upper parts into light sepia & then into the white of the lower regions. In fact the first Finback I ever saw (at Van Is.) I described in this way.

The gray prolongations on the sides are broad & long, those on the left side reaching the mid ventral line. There is also a narrow, ^{longitudinal} shading of gray on the ventral line, a little anterior to the navel.

Pectorals

Have the usual coloration of the Finbacks.

Second Baleen

Has typical Finback shape. In this whale the usual white portion of the baleen on the right side is lacking. From a distance of 22 inches from the tip, the baleen plates are light colored but only 2 are entirely white & the effect is like that of the sei whale baleen when observed at greater distance. The usual white portion of the under edge of the rostrum is present but is not clear white - it is tinged with grayish. The baleen plates are striped and look

exactly like those of other Finbacka.

Measurements

	Eng. feet
Total length along side	= 64' 4"
Flukes to post. inst. of pectoral	= 42' 5"
" " " " " dorsal	= 16'
Snout to eye	= 13' 3"
Flukes to anus	= 18' 8"
" " navel	= 26' 6"
Pectoral tip to head humerus	= 8' 1"
" " " ant. inst.	= 7'
" " " post. "	= 5' 3"
" greatest breadth	= 1' 10"
Height dorsal vertical	= 15"
Length baleen row	= 12' 10"
" longest plate baleen	= .3'

[These measurements were taken with a cloth tape as all the succeeding ones will be. My steel tape is broken.]

Nee Taihei 10.30 a.m.

No 55 Blue whale ♀ July 26/10

A light whale. The line of white markings from root of fin down & back is scattered. The light gray markings are especially thick on lower back ~~above~~ directly above fin - many white scars on peduncle. The light gray markings follow down close to the ends of the folds but do not run over on them. There are a few grayish markings on upper surface of fin. A few large ashy markings on right ramus. Dorsal very low & has anterior edge whitish - shape like this:



Rib 15 per ribs seen

Milk Milk was flowing from mammary & the mammary glands were greatly enlarged. They looked exactly like those of the Humpback which I described at Van. d.s.

Scapula The upper edge of the scapula shows plainly ~~carrying~~ a depression immediately above it (before flensing) and I believe that my theory that the depressions observed in the backs of living Hump &

Finsbacks is produced by the action
of the scapular muscles, is correct.
Measurements.

Total length navel to snout	= 76' 10"
Snout to eye	= 15' 10"
" " blowhole	= 14'
width " dorsal	= 18' 4"
" " armpit	= 21' 6"
" " navel	= 33 8"
" " pectoral post. inst.	= 52' 3"
Height dorsal	= 6"
Pectoral tips to head humerus	= 44' 10
" " ant. inst.	= 9' 4"
" " post. "	= 7' 6"
" breadth	= 2' 10"
Eye to ear	= 4' 2"

Rex Main

29.M. - cut at 4 a.m.

No. 56 Sperm ♀ July 28/10 Alabama

Cut at end of wharf in water.

Color General color slate. There is a large

 shincircular patch of pure white extending
 hard about back to genitalia & well up on
 genitalic sides. This is same place where others
 are usually gray & same shape of
 patch but larger) immediately above
 it on the upper sides ^(left) is a smaller
 patch (irregular) of pure white; there is
 also a large irregular patch of white
 at anterior base of dorsal hump.
~~The sides from the white patches~~
 forward to pectoral fins are
 washed with gray. Gray washing
 about genitalia. A good many
 white scars & barnacle cervices on
 lower half of head.

Pectorals

Have a few rather small gray
 markings above.

Four small crenulations aft
 of dorsal hump.

Teeth

23-28 upper teeth not visible.

Measurements No. 56.

Total length ex of head to notch along side	^{by cutter} = 37' 2"
Notch to hump center	= 13' 9"
" " " apex	= 12' 4"
Ex of head to eye (straight)	= 7' 9"
Flukes tip to tip	= 9' 10"
Length mammary slit	= 12"
Dist. between "	= 8"
Height hump (vertical)	= 10"
Front Fin tip to head terminus	= 3' 9"
" " ant. nostr.	= 3' 3"
" breadth	= 1' 8"

No 57

Sperm ♀ July 28/10 air sea
 General color slate. much light gray
 about navel in the usual semicircular
 patch - ^{light} gray on sides above navel in
 small patches & markings, and
 forward on sides & fin in small
 flecks. On the head from the blowhole
 on a line to the eye, are ~~—~~ a few
^{light} gray markings. also a few white circles
 like those on Humpback. Edges of
 upper lips and jaw white - snout
 slate except for a few dashes of
 white

Head

I do not believe that age makes any
 difference, or at least but very little,
 in the sharpness of the V of the lower
 portion of head; all the specimens I

have examined have been about the same.

There is a bulge on each side at the mandibular condyles.

Throat furrows
There seems to be no definite arrangement of the throat furrows in this species but their position remains constant.

Milk

Milk was flowing from the mammae above & below slate - The posterior edge strongly convex & the anterior margin slightly so - notch deep. The point of the convexity of the posterior edge is at the junction of the first & second thirds of the flukes (proximally)

Teeth

24-24 The teeth sharp & only slightly worn on the "anterior-outside". The teeth in the upper jaw ~~show~~ are visible in several places. They are usually situated above & a little in front of the socket into which the lower tooth fits.

In some cases however they are a little behind & above socket & in others directly above it.

There were about fifty individuals in this school.

No. of whales
in school

Blues

10 pros.

Eye

There is a gradual but rather prominent bulge in head outline just in front of and above eye. The eye itself is very small & deeply situated - ^{the eyeball} it does not bulge outward as in the Mystacoceti. The lids are thick and heavy; there are two short semicircular creases, one above & one below the eye. The general effect reminds me of an elephant's eye. Iris hazel brown.

Ear

The ear is an elliptical opening one inch in diameter (horizontal) situated eleven inches behind and four inches below the eye. A good sized pencil could easily be inserted for its entire length. (The ~~ear~~ auditory meatus is thus much larger than in the Mystacocete)

Measurements

Total length ex. of head to notch)	= 33' 11"
Notch of flukes to center of bump)	= 13' - 2"
" " " " anus)	= 11' - 1"
" " " " navel)	= 18' - 3"
" " " " pectoral (post. auct.))	= 23' - 1"
Ex. of head to eye.	= 7' - 4"
" " " " corner mouth)	= .5 - 10"
" " " " post. inst. fin)	= 11' - 3"
Tip of mandible to corner of mouth	= 4' - 6"

Dist. between corners of mouth (below)	= 2'-10"
Eye to corner of mouth	= 2'-4"
" " blowhole (center)	= 6'-8"
Length blowhole (straight)	= 12"
" " (curved)	= 13"
Cent. of blowhole to tip of mandible (closed) over the curve of the side of head	= 5'-3"
Tip of lower jaw to ex. of head - taken in center of head from line drawn up from lower jaw	= 1'-6"
Height hump vertical center	=
Flukes tip to tip	= 9'-6"
Ant.-post breadth	= 8'-5"
Depth notch	= 12"
Eye to ear.	= 11"
" opening	= 2"
Ear "	= 1"
Fins tip to head curvature	= 3'-5"
" " ant. most	= 2'-10"
" breadth greatest	= 1"-8"

The measurement from tip to post. edge
of fin is very unsatisfactory & can
seldom be accurately taken, there-
fore I have omitted it.

[contained a small foetus (preserved)]

no 58

Sperm ♀ July 29/10 Aisawa, Japan

Drawn-out on slip. whale had two humps.

Color

General color slate. There is a crescent shaped patch in front of genitalia as usual & gray extends up to the mid-lateral line. ~~as usual~~

The gray patches are large & heavy. Many light gray flecks & dashes along sides, on the sides of the peduncle, and a scattering line of them obliquely forward on to the lower back.

A few extend forward on the sides as far as pectorals. A few gray flecks & patches between pectorals on the breast. No light gray immediately about navel. A few light gray flecks on upper sides near & behind first hump. A ~~soft~~ line of scattered rather large light gray marks from eye to blowhole. Lower two-thirds of extremity of head white mixed with gray - upper lips white & mandible white, its central portion ^{small} thickly marked with longitudinal oblong gray spots.

Head &
Back outline
The outline of top of head from the extremity to base of skull is slightly concave - ~~at~~ base of skull there is a rise & from here to first hump back surface very slightly concave;

from the first hump to the flukes
the surface of peduncle ridge is a
straight slant broken by ^{low} crenulations,
and a second "hump" just in
front of flukes which is as
large as the first humps.

Flukes Post. edge injured

Throat creases The creases are very short &
irregular anastomosing frequently.
They occupy a space from the branch-
ing of the mandibular to about one foot
behind corners of mouth. They are
only in the central portion on either
side of the median "keel" & do not extend
up to corners of mouth.

Blowhole The blowhole is situated in the center
of a prominent bulge or swelling
which rises abruptly on the left side of
the head near the extremity; the ant-
erior end of the blowhole is just 13 miles
behind a line drawn ~~from~~ up from
the extremity of the head.

Below the swelling of the blowhole on
the left extremity of the head is a broad
~~shallow~~ but well marked depression
which runs from the extremity of
the head to about opposite the posterior
end of the blowhole where it broadens
out & is lost. The thick upper wall

Feces

~~000~~
23-23

of the blowhole is higher than the lower, (or that on the left side,) and rises more abruptly. ~~from the~~ In this specimen the blowhole is ~~more~~ singular & does not have the shape seen in the former ones it is like this

10 p.m.

This animal seems to have a disproportionately short head. While such a great difference in size between the male & females as found, variations in the proportion's of the body may also be expected.

measurements

Total length ex. of head to notch	= 41'-2"
notch flukes to anus	= 13'-3"
" " " navel	= 22'-5"
" " " anterior dorsal bump	= 16'-4"
" " " posterior " "	= 5'-4"
" " " post. most. pectoral	= 27'-10"
Ex. of head to eye (straight)	= 8'-5"
" " " corner of mouth	= 7'-3"
Tip mandible to " " "	= 5'-10"
D. int. between coros. " " below	= 3'-7"
Eye to " " "	= 2'-8"
" " ear	= 13"
" above "	= 3"
" opening	= 2.5"
Ear "	= 1"
Eye to blowhole center	= 8'-2"

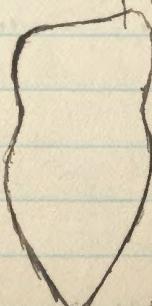
shinner, set
area of furca mass

Ex. of head to post. vent. pectoral	= 13' - 10"
Length blowhole (sl.)	= 1' - 4"
Fins tip to head humerus.	= 4' - 2"
" breadth	= 2' - 2"
Flukes tip to tip	= 11' - 10"
" depth notch	= 13"
" ant-post. breadth	= 4'
Height hump "	= 7"
Dist. between mammary slits	= 11"
Length "	= 14"

no 59

Sperm ♀ July 29/10 (juv.?) Aikawa
Cir in the water at end of wharf.

Color General color slate - little gray about naval, but the light gray color is heavy along sides from opposite naval to fin - A few white flecks on throat - light gray flecks along the superior edge of the peduncle from area ~~to~~ almost to flukes. The whole lower half of head is light gray marked with very light gray dashes.
Cross section of head is this;



Teeth $\frac{0-0}{24-24}$ anterior teeth
not above gum

measurements of no 59

Total length (by cutters)	= 30'
Flukes tip to tip	= 8'-11"
notch to bump (center)	= 14'-1."
" " arms	= -
Height bumps	= 7"
Ex. of head to eye (straight)	= 7'-10"
" " " cor. of mouth	= 6'-5"
Tip mandible & " "	= 4'-4"
Eye to blowhole	= 7'-6"
Blowhole (center) to tip of mandible closed	= 5'-1"
Length blowhole (straight)	= 10"

Blowhole angular

Fins tip to head humerus	= 8'-6"
" breadth	= 1'-7"

no 60

Sperm ♀ July 29/10 Aikawa, Japan

This whale contained foetus no 60a

Color

General color slate. The light gray color is in bands about 2 inches wide which run from genitalia's lower sides forward ~~as far as~~ ^{sharpen the sides go} half way to pectoral fins, ~~and~~ on ~~the sides~~ these bands end in a mass of fine dots which reach nearly to the pectorals and give a "jeffer o salt" effect. The band on the ventral surface runs from the genitalia to the navel coming together there in a point. These bands give a peculiar striped

Blowhole

appearance to the whale

Angular like no 59 only the angle is
a true right angle LEye

The eye was preserved in alcohol.

The eyeball has the shape of a wide ellipse almost round; its circumference is 175 mil. (unrimmed) The pupil is 10 mil. in length and slightly crescent shaped. The iris is dark ~~shadest~~ - its long diameter is 25 mil. There is then a narrow ring of bluish white, which is sharply differentiated from the outside elliptical ring of dark gray. The remainder of the eyeball is yellowish white.

Teeth

o - o No sign of upper teeth was
24 - 24 found by cutting into the gum

Measurements

Total length (by cutters)	= 31'
Notch flukes to hump	= 14' - 1"
" " " anus	= 10' - 7"
Height hump	= 8 1/2"
Ex. of head to eye	= 7' - 9"
" " " corner of mouth	= 6' - 1"
Tip of mandible to " " "	= 4' - 9"
Dist. between " " "	= 2' - 11"
Eye to ear	= 12"
" " corner of mouth	= 2' - 4"

shaded bump.

no 60a Sperm Foetus ♂ (mother no 60)

This animal was fully formed had thick blubber, & heavy epidermal layers & gave every appearance of being ready for birth. I am sure it would have been born within a few days.

Color General color of body light slate - a little lighter than of the adult. The entire lower section of the head, from a point a little behind and below eye to the shallow ~~depression~~ depression below the blow-hole is white tinged with grayish. An area at the base of the skull in a line with the blowhole is grayish white - From navel to anus & a little way up on sides whitish; streaks of whitish along sides nearly to fins. The entire lower parts from navel to a point about opposite eye are very light grayish. The ~~upper~~ upper lips & edge of mandible pure white

Fins Light slate like body; the left lobe below has a scattering line of white spots (small) from the anterior insertion half way across lobe - also on the anterior edge. Right lobe unmarked.

Body Head outline has no concavity (it is a straight slant upward from ~~the~~ extremity to ~~base of~~ proximal end). There is then a sharp dip at base of head and a slight

convexity to bump. From bump back -
wade to a short distance from flukes
 insertion the body outline is a straight
 downward slant broken slightly by four
 low crenulations — there is just an
 indication of a second bump — and
 then the slant to the flukes is rapid.

Blubber

On the sides the blubber is $2\frac{1}{2}$ inches
 thick

Osteology

Scapula

The bones were almost all ~~fatty~~
 ossified altho' soft bone.

The long axis of the scapula as it
 stands in position is vertical — the glenoid
 fossa is tipped forward at a slight angle —
 the acromion is quite deeply imbedded.
 The center of the glenoid fossa of the scapula
 is exactly above the anterior edge of
 the sternum as they stand in position.

Only the posterior half of the scapula
 lies on the ribs — the anterior half covers
 the space between the first rib and the
 base of the skull which in life is
 occupied by the ^{nasal} gill cartilage.

Ribs

The first rib articulates directly to the
 sternum; the next two ~~two~~ have long
 sternal ribs which articulate to the sternum.
 The costal cartilages are the fourth and
 fifth ribs are closely joined & the
 fourth articulates to the sternum but the

fifth does not reach by about an inch.
The sixth & seventh costal ribs are close together distally but do not reach sternum,
the 8th is very short and is only a point of cartilage.

There are ten pairs of ribs, the last two being very short.

Head
The tube of the blowhole (which is lined with dark epidermis) runs along just under the blubber, and opens on the left side of the top of the head near the extremity. Directly below the blowhole tube is the case containing the more or less liquid spermaceti.; ~~the walls of~~ this case are tough and fibrous.

Below (directly) the spermaceti case is a second tube lined with gray epidermis which opens ^{up} forward around the anterior end of the oil case into the blow-hole. Posteriorly this second tube opens into a large, shallow, upright chamber lined with epidermis, immediately ~~behind~~ which lies immediately behind the posterior end of the barrel-like spermaceti case. A tube the size of my finger leads from this shallow chamber into the posterior nasal opening. The tube which leads ~~leads~~ the upper blowhole tube which leads into the posterior nares

is the size of three fingers - much larger than the lower one.

Under the oil case (below the second tube) is a sac of spermaceti is a solid consistency, which is run thru' with small fibers.

Pectorals

The formula for the phalanges of one of the pectorals is as follows -

I	II	III	IV
5	3	4	2

Measurements

Total length (straight)	= 3950 mil.
" " over back	= 4050
Ex. of head to eye straight	= 780
" " " cor. of mouth	= 654
Tip of mandible " " "	= 400
Corner to corner of mouth (below)	= 307
" of mouth to eye	= 245
Eye to blowhole (center)	= 660
Cent. blowhole to tip of mandible (closed)	= 525
Ex. of head to post. vent. fin	= 1330
Eye to ant. vent. fin	= 395
Length blowhole straight	= 93
" " curved	= 1151
Eye to ear	= 135
" above "	= 18
" opening	= 33
Ear "	= 4
Notch flukes to anus	= 1400

Notch flukes to navel	= 2160
" " " penis	= 1900
" " post. inst. fin	= 2790
" " cent dorsal bump	= 1660
Flukes tip to tip	= 1010
" ant. post. breadth	= 505.
" length right lobe axially	= 605.
" " left " "	= 635.
" depth notch	= 105.
Height bump vertical	= 90
Depth body at flukes insertion	= 303
" " between " " + ames ^{nudibranch} = 55-9	
Semi-cir. body at ames	= 770
" " " in front of fins	= 1000
" " head at eyes	= 950
Dist. between ant. inst. fins below	= 495.
" " post " " "	=
Fins tips to ant. insertion	= 496
" " " post. "	= 2950
" breadth	= 214

Gö Hage 3 P.M.

No 61

Sei whale ♀ July 30 / 10 Aikawa

A strongly bluish whale. A white band runs from ant. inst. fin down & back obliquely ending at mid ventral line about 18 inches in front of furrows. This band ~~was~~ is parallel with the ends of the furrows. Between this white band & the ends of furrows the folds are dark gray, thus making a band of dark gray about 18 inches wide which is darker than the surrounding body parts and is the band I have referred to in other descriptions.

The white band is prominent in this specimen - in older whales I have seen it was only suggested.

From navel to genitalia ventral line is white - from genitalia to flukes ventral line is like sides of peduncle. Many small patches of white about genitalia.

Great number of white scars on peduncle sides. Thirteen folds under fin on right side are gray. About two feet anterior to flukes the gray markings cease leaving this plain blue gray.

The dark blue gray of the dorsal ridge occupies just ~~one quarter~~ of the upper fourth of the peduncle and shades gradually into light blue gray. The grayish markings on dorsal greater are scattered & very dark. Anterior to the

dorsal fin the dark blue gray occupies the upper one-third & shades into light blue gray on lower two-thirds. There are a few scattered gray markings over ventral line between mouth & ends of pectorals & a very few run over anterior folds.

Measurements

Total length (by cutters)	$18'24$ = ^(1524 mm) 50'
notch to axilla	~ 434 = 14'-3"
" " dorsal	~ 483 = 15'-10"
Snout to eye	~ 330 = 10'-10"
Depth peduncle at pectoral insertion	~ 94 = 3'-1"
Height dorsal	~ 53 = 1'-9"
Flukes ant.-post. breadth	~ 112 = 3'-8"
Fins tip to head humerus	~ 218 = 7'-2"
" " " anti. n. st.	~ 183 = 6'
" " " post "	~ 145 = 4'-9"
" breadth	46 = 1'-6"

No. 62 Sei whale ♀ July 31/10 Aukawa
Color Entire ventral line from end of pectorals back light pink - near flukes the pink occupies only the very edge. There is no gray band across belly & but very little gray on sides.

Right lip gray shading into very light gray on ramus. The gray of the lip extends to fin & just above fine (including eye) all the folds of the central throat

breast are tinged with pink - the folds of the belly have little pink - all almost white. On the right side only the ramus is gray but the gray color spreads out backward and to 10 folds between corner of mouth & fin. The pink in the furrows is deeper than that on the folds. There is a suggestion of the gray abdominal band with it stops far short of the ventral line & is only suggested.

Top of head clear blue slate - there are two prominent but broken ridges on each side of the median ridge & running parallel with it.

These ridges begin opposite the nostril and here each one is about 8 inches from the median ridge; at the tip of the snout where they end ~~they are~~ each is about 2 inches from the median ridge.

Under edges of snout for about one foot are pinkish

Flukes

Below have a narrow posterior edge of gray and rest of lower surface a delicate pink thickly lined with fine gray lines so that general effect is a little lighter than sides of peduncle. The fine grayish lines run from anterior

edge in a curve across lobe curving in toward each. In distal portion of lobe they run across from anterior edge & then turn sharply inward running along post edge.
The general effect of flukes below is pinkish-gray.

Measurements.

Total length	$1285 = 42' - 2''$
Flukes tip to tip	$\sqrt{348} = 11' 5''$
" left lobe axially	$\sqrt{190} = 6' 3''$
" right " "	$\sqrt{193} = 6' 4''$
Height dorsal	$\sqrt{31} = \cancel{5' 2''}$
Width flukes to dorsal	$\sqrt{368} = 12' - 1''$
" " " anus	$\sqrt{366} = 12'$
" " " navel	$\sqrt{556} = 18' - 3''$
" " " post. inst. ^{9/4} _{falcata}	$= 30'$
Snout to eye	$\sqrt{\cancel{97}} = 9' - 2''$
" " blowhole (center)	$\sqrt{236} = 7' - 9''$
Fin tip to head humerus	$\sqrt{178} = 5' 10''$
" " " post. inst.	$\sqrt{120} = 3' - 11''$
" " " ant. "	$\sqrt{157} = 5' - 2''$
" breadth	$\sqrt{35} = 1' - 2''$

Blubber light pink

No 63 See whale 2 Aug 1/10 Aikawa

Top of head all clear dark blue gray & show the same ridges running parallel on each side of median ridge that I described on last whale. They go clear to tip of snout. There is also on each side a deep crease about a foot long opposite the anterior half of the blowhole.

Whole throat & breast to a little in front of fins light gray - the furrows are dark gray and the folds lighter.

On left "ventral side" from a point about two feet anterior to fin to about 6 ft from end of ~~folds~~ furrows, the folds are strongly pink & furrows also. This patch is comparatively small.

Right lip gray shading into lighter gray on ramus which is same color as throat and breast. There is a small pink patch just below mandibular symphysis.

There are 16 folds in the pink ventral patch. The abdominal folds back of the pink patch are gray tinged with pink.

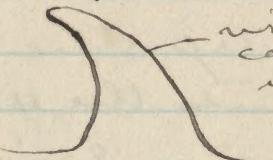
Peduncle light blue gray. The gray markings extend on sides over the ends of furrows but are scattered.

Fins have central portion (below) very light

gray (lighter than sides) & a wide posterior
edge dark gray also a very narrow anterior
edge of dark gray above blue gray
like head & stock

Dorsal

Blue gray



not quite so
convex as is
usual

Measurements

Total length by callipers

$$\checkmark 1280 = 42'$$

Fishes tip to tip

$$\checkmark 303 = 9' - 11"$$

1 " to dorsal

$$\checkmark 376 = 12' - 4"$$

" " anus

$$\checkmark 361 = 11' - 10"$$

" " penis

$$\checkmark 411 = 13' - 6"$$

Height dorsal

$$\checkmark 28 = 11"$$

Snout to eye

$$\checkmark 270 = 8' - 10"$$

" " blowhole

$$\checkmark 223 = 7' - 4"$$

Fins tip to head humerus

$$\checkmark 175 = 5' - 9"$$

" " " post. nostr.

$$\checkmark 122 = 4' 0"$$

" " " ant " "

$$\checkmark 152 = 5' 0"$$

" mouth

$$\checkmark 35 = 1' - 2"$$

Blubber a delicate pink

10:30 A.M. Roko Marn

No 64 Finback ♂ Aug 5/10 aikaria

Right ramus & tip light gray except near tip which is white. The gray points which run up toward ramus are not indicated.

On the left side the dark gray color runs into the 4th furrow from the median line at the tip of the jaw.

The curve of upper edge of peduncle down to flukes is more abrupt than that of lower edge.

Bluish light amber.

Angle of flukes with body axis



Ribs

13 per ribs

Measurements

Total length = 61' - 9"

= 61' 9"

Navel feathers to eye = 48' - 10"

" " " arm = 16' - 9"

" " " penis = 21' - 6"

" " " navel = 27" - 8"

" " " dorsal = 14" - 10"

" " " pectoral = 40' - 5"

Fin tip to head humerus = 8' - 3"

" " " ant. nisert. = 7' - 4"

" " " post. " = 5' - 7"

" " breath = 1' - 10"

Height dorsal = 1' - 5"

Snout to eye = 12' - 11"

ant. post. breath feathers = 3' - 7"

Eye to ear = 2' - 11"

Length largest whalebone = 3' - 2"

Length white portion of tail = 2' - 10"

Sei Whales Color

Aug. 2nd & 3rd I spent outside on the w/s "no s. Hogen Maru." Four sei whale were killed during that time as follows:

no 651	♂	40 ft.	} Aug. 2 nd
" 66	♀	41 ft.	
" 67	♂	45 ft.	} Aug. 3 rd
" 68	♀	48 ft.	

Nos. 651 + 66 had the throat breast & abdominal folds light pink - the furrows of the entire throat were dark gray. On the breast & abdomen a few furrows were pink. There was no gray band extending across abdomen at navel & the entire ventral line of the peduncle was pink - a little deeper pink than the folds. There was no bluish tinge to the general body color. The color of the peduncle & sides was very light gray shading into the light pink of the ventral surface very gradually.

The top of the rostrum from the tip to the eye was clear gray (not very dark). From the eye the gray head color extends in a curve up & back onto the dorsal surface; there was a space about two feet wide directly above the fins which was much lighter gray than the back color.

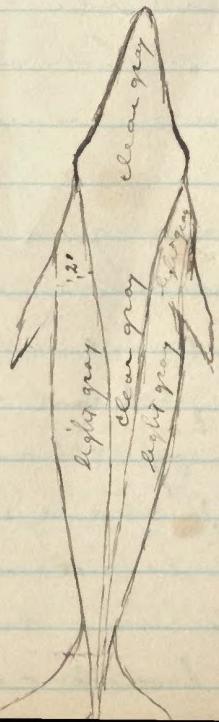
and the line where the two colors met was well marked.

A band of dark gray as broad as from ant. insert. of fin to end of furrow & of uniform breadth, ^{throughout} extended down & back obliquely almost to ventral line.

Nos. 67 & 68 had the throat furrow all dark gray. The folds of the throat & breast were not pink but white.

The general color of the body was much darker than that of nos. 1 & 2.
No. 67 had a broad area ~~of~~ on the abdomen clear mouse gray.

Seen from above the whales would look like this:



The underside of the flukes of nos 1 & 2 were very light gray almost white & lined as usual.

- long

"the Taihei" 3:30 P.M.

note 7 Sei whale ♂ Aug 5/10 Akkava Rehuyee

Throat folds white - Right ~~comes~~ up
eight gray shading into pinkish white on
lower portion of ramus. Flukes at
about the same angle as at finback

Total (by callipers)	= 48'-4"	1473
Flukes to dorsal	= 14'-2"	432
" " " ances	= 11"-11"	363
Snout to eye	= 9'-3"	282
" " blowhole	= 7'-1"	216
Height dorsal	= 1'-6"	46

Notes on a foetal Sei whale 8'-6" long taken from
a female 48 ft. long killed Aug 5/10 (unpubl.)

The blowholes are situated between and above
two prominences which meet anteriorly
forming a V. By inserting my fingers in
the blowholes ~~thus~~ and pressing downward
& forward enough to open the interior
nasal passages the prominences at
the sides & in front of the nostril, were
considerably raised. This must be the
position take assumed during ~~the~~ expira-
tion, as the expulsion of the breath opens
the interior nasal passages.

By spreading the nostrils until they
~~were~~ took the form of a wide ellipse which
as shown by my photos is their condi-
tion during inspiration, both edges
of the blowholes were ^{raised} ~~sacred~~, the inner

slightly, & the outer greatly. I believe therefore that the only difference in the position of the nostrils during the two respiratory acts is that the adjacent edges are raised to a greater extent because of the wider opening of the nostrils during inspiration than during expiration.

I am aware that this view is contrary to the position taken by me in a recent paper, however I can conceive that this is ~~not~~ correct. Before I had not examined ~~the~~ a whale with this end in view.

No 70

See whale ♂ Aug 18/10 Akkuna 8 p.m.
Go Hoge
Entire throat central breast & abdomen light pink-furrow deep pink - between corner of mouth & fin seven folds are light gray - then a wide pink unmarked space under fin & opposite middle of fin laid back a short, light gray band runs obliquely down & back - Moustache line pink to about 6 ft. in front of finless -

Navel at end of furrow - This whale had a great quantity of partly digested fish in its stomach, Capt. Andersen told me it was pursuing a school of small fish when he killed it - The fish were said to be sardines.

Total length (with cutters measure)	= 41' 6"	12.65
-------------------------------------	----------	-------

Flukes to arrees = 11'		335
------------------------	--	-----

" " navel = 17' 6"		533
--------------------	--	-----

" " post vent peduncle fin = 28' 6"		868
-------------------------------------	--	-----

Measurements of Sperm whales taken
at Akkawa, Japan during season of 1909

July 21	Sperm	60 ♂
" 25	"	40 ♀
" 25	"	43 ♂
" 27	"	40 ♀

Nine Sperm taken at Oginohama but
were not measured; during 1909

In all the whales which I have examined of all
species there was considerable differences
in body proportions vis - vis the relation
of the circumference to the length. Some
whales were very "thick" others being long
& slender comparatively.

no 72 See whale ♀ juv. Aug 20, 1909 - Akkawa Roppe Maru
Ventral surface all ^{light} pinkish - throat, breast,
abdomen & ventral line of peduncle almost
to flukes - on right side of throat a few furrows
were dark gray, but most all pink.

Total length = 30' - 10" 940 "

Flukes & navel = 13' - 5"

" " anus = 8' - 2" 248 "

Flukes (notch to tip along post edge) : 3' 11" = 119"

" tip to tip (estimated) = 7' 8" = 234

Snout to eye = 6' - 1" = 185" Fin breadth = 11" = 28

" " blawhale = 4' - 10" = 147" navel at end off

Height dorsal = 10" = 25" furrow

Fins tip to ant. nost. = 3' - 11" = 119"

" " " port " = 2' - 9" = 84"

Notes on Humpback Skeleton No 25. ♂

This specimen was saved for me, but the skull was so badly broken by a blow from one of the harpoons that I decided not to send it to New York.

Vertebral
formula

C D ~~B.~~ & Ca

7 14 33

= 54

I am certain of

this formula, but could not be sure of the lumbar units.

14 pairs of ribs.

Cervicals

The atlas is free. It has a low spine, & thick transverse processes which extend directly outward. The metapophyses are low, thick & tubercle-like.

The axis & 3rd cervical are ankylosed by their neural arches, the centra being free.

The axis has ~~—~~ upper & lower transverse processes; on the right side these are ankylosed to form a ring; on the left side they do not meet this being ~~as of~~ space of 80 mil. between their distal ends. The transverse processes are directed outward & somewhat backward; the neural spine is a low ridge. The 3rd cervical has a slender upper process & a thick, short lower process directed strongly downward.

The lower pair The 5th is the last vertebra with a lower transverse process. The upper processes become thicker as they go backward. The spines of the 4th & 5th vertebrae are very low & small, that of the 6th is higher &

they then all rise gradually, all the cervical except the 2nd & 3rd are free.

atlas

Measurements of atlas mil.

Height vertebral anterior face = 360

Breadth greatest across trans. proc. = 680

" across 2 articular facets for occipital condyles = 395.

~~atlas~~ Axis

Height greatest = 370

Breadth " across trans. proc. = 830

Length upper trans. proc. (from face) = 250

" lower " " " (left side) = 140

Breadth of articular facets for axis = 423

skull

skull

Length palatine = ^{mil} 710 straight

Breadth " = 320

Length maxilla from tip to base below = 2900

" skull straight below (^{tip to base of condyle}) = 3710

" rostrum " = 2870 straight

Breadth " at middle (over curve) = 840

Length nasals = 265

Breadth of orbital process of frontal at orbit greatest = 360

" " " " inside orbit = 220

Distance from proximal end of maxilla (at nasals) to the orbital end of its orbital projection = 1135.

Breadth across occipital condyles = 425 curved

Depth of " " " = 320 "

Greatest breadth skull [squamosal] obtained by adding to the left side the dist. that the squamosal projects beyond the frontal process on the right] = $2110 + 100 = 2210$ mil

~~The ends of the pterygoida do not reach within
the width of the proximal ends of the nasals
The prox. ends of nasals & maxillæ are
almost opposite each other - the maxillæ do not
quite make the end of the nasals
The proximal ends of the pterygoida
are opposite the prox. ends of the
nasals~~

The proximal ends of the nasals maxilla
& pterygoida are almost on a line
with each other

The corner is visible between the
maxillæ below - also between the
palatines ~~opposite~~ to me very slightly,
at their proximal ends

Measurements of whales taken at Aickam
during 1910 - measured by cutters. All
measurements should be discounted about
~~3~~ feet.

Apr. 29 Finback 61 ♀

April 30 Finback 54 ♂

No 71 Sperm ♂ Aug 20, 193

6.30 a.m. San Jose

May 3 Sperm 5'2" ♂
 May 3 Sperm 4'9" ♀
 May 3 Sperm 4'6" ♀
 May 7 Finback 6'0" ♀
 May 10 Finback 6'4" ♀
 May 16 Finback 6'6" ♀
 May 14 Finback 6'3" ♀
 May 17 Finback 6'1" ♀
 June 10 Finback 4'7" ♀
 June 13 Finback 6'3" ♀
 June 13 Finback 6'4" ♀
 June 14 Finback 4'8" ♂
 June 17 Finback 6'2" ♀
 June 19 Finback 6'7" ♀
 June 19 Sperm 4'3" ♀
 June 20 Finback 6'0" ♂
 June 23 Sperm 4'7" ♂
 June 27 Sperm 5'0" ♂
 June 24 Sperm 3'4" ♂
 June 26 Sperm 3' 4" ♂
 June 29 Finback 7'0" ♀
 June 29 Sperm 4'6" ♂
 June 29 Finback 9'6" ♀
 July 3 Finback 5'4" ♀
 July 3 Finback 3'6" ♂
 July 7 Finback 7'1" ♀
 July 7 Finback 7'1" ♀
 July 9 Sperm 3'1" ♀
 July 12 Finback 3'0" ♀
 July 12 Finback 5'6" ♂
 July 13 Sperm 3'4" ♂
 July 16 Sperm 5'0" ♂

General color slate - much white
~~about~~ ~~from~~ ~~about~~ ~~navel~~ ~~to~~ genitalia +
 up on sides as far as mid-lateral
 line. The white ~~area~~ runs forward
 to a couple of feet beyond navel &
 is in wide bands or stripes, peppered
 with fine gray dots - white does
 not extend backward to arms - a large
 grayish patch at ant. base of dorsal bump.
 Besides ~~the~~ ~~the~~ back above the mid-lateral
 line are unmarked - no flecks of lighter
 color. Lower half of sides of head cross-
 crossed with fine white streaks & flecked
 with white - ex. of head flecked with
 light gray. As a whole it's white
 pattern less white than usual.
 Blubber is "crinkled" on sides to pectoral
 smooth ~~area~~ from pectoral to eye - "crinkles"
 extend up on upper sides & back

as far forward as opposite eye - the
 wrinkles end about 3 ft in front of plebes
 or sides. Fins unmarked.

No evidence of upper teeth $\frac{0}{20-20}$

Total length = 39'-6" Finbreadth: 2'-1"

Blubber pectoral = 24'5" six individuals
 " " bump = 15'3" in school.

" " arms = 12'3"

" " pectoral = 17'5"

Height bumps: "

ex. of head to eye (bl.) = 10'-10"

tip jaw to cor. of mouth = 6'-8"

Fin tip to head bumpers = 4'-3"

" " ant. most = 3'-6"

July 16 S. + 1 Finback Q 51
 July 15 Finback Q 30
 July 15 Finback Q 62
 July 17 Finback 55 Q
 July 18 Blk whale ♂ 63
 July 19 Sei 51 ♂
 July 20 Sei Q 50
 July 20 Finback 64 ♀
 July 21 Finback 69 ♀
 July 22 Sei whale Q 52
 July 23 Finback Q 63 H.
 July 23 Sperm Q 47
 July 23 Sperm 37 ♀

No 721 Sei whale Aug 22/10
 Total length = 39'
 Intermediate between
 class I & II

Bifurcated Also one which I found on the beach from a sei whale
 sei whale first ribs. The first rib of the sei whale which I sent to Holmes, was
 bifurcated; also one which I am bringing from another whale

Two sperms July 28/10

with one harpoon Capt. M. Jacobsen killed two sperm whales (small)
 with one harpoon. The harpoon went thru' the
 first & was fast in the second which was
 close beside it. This story was vouch'd for by two gunners
but I am certain it is impossible for
sperm to be hard to get fast to

Bottlenose July 30/10

Capt. Olsen saw many Bottlenose whale
 today

734 J. H. Osgood 8 P.M.
 No. 722 Sei whale ♀ Aug 20/10
 Between class I & III

A very dark whale - ventral line
 from gills to flukes gray like sides
 of peduncle. The gray band from fin to
 end of furrow is but slightly emphasized.
 Central breast from opposite and
 fin insertion to opposite tip of fin laid
 back has folds pink & furrowed.
 Deep pink. From tip of fin laid
 back to naval abdomen is gray
 tinged with pinkish - the usual
 oblique light line from fin down
 to body is absent - no bluish tint
 to whale - Right lower lip partly
 dark gray shading into lighter
 gray on ramus. 12 folds under
 right fin gray. Entire throat &
 breast & vent. of fins has
 fold gray tinged with pink to
 flesh color. See dash gray
 Left lower lip dark gray shading
 into a little lighter gray on
 ramus - not much difference
 between right & left lips & ramus
 Naval at end of furrow

Total length = 43' - 2" = 1315" ^{v. 902}
 Culbert's post. vent. pectoral = 29" ^{v.}
 " tip to tip = 10' - 6" ^{32°} This whale
 " dorsal = 12' - 10" ^{39°} had bifurcated
 " ~~dorsal~~ = 12" ³¹ first ribs.
 Length dorsal = 12" ³¹ first ribs.
 Snout to eye = 8' - 10" ^{26.9 V}
 " " blowholes = 6' - 10" ^{20.9}
 Fin tip to head humerus = 5' - 9" ^{17.5 V}
 " " ant. inst. = 5" ^{15.2}
 " " post " = 3' - 10" ^{11.7}
 " breast = 1' - 3" ^{38.8}

Finback See no 22 for good external description.
Color

Fin
based by
Killer

~~See~~ whale no. 23 for this

Asteroids. Colors deep blue, + other shades to green
blue - some olive greenish. The red of
various shades from brick red
to carmine - The others of
yellowish white mingled with purple.
All taken June 12/10 at Akkaroq, Jaffey

A young Finback taken at Akkaroq June 14/10
48 ft. long ♂ has 58 breast folds - The pectoral
above had the entire anterior edge white - the
dark gray prolongations were almost absent
only one showing which ran down for a
short distance exactly opposite the tip. The
fin and back - I found one of the "nest"
parasites on this animal.

Si whale
descript.

For good description of Si whale color see
no 38 ♀

Finback Eye markings For markings about eye & ear of Finback
see no. 37 ♂

Finback
white baleen
absent.

See whale no. 54 for absence of white baleen

a new. On June 11/10 a Finback whale of 42 ft. Parasite long was brought in at Akkawa & on whales the body was the host of a parasite which I have never seen on whales before, nor have I known of its record.

For some time past I have recorded the presence of white & gray "scars" on ~~the sides, &~~ entire body, but especially the sides of the peduncle, of Blue, Finback & Sei whales. These scars ^{nearly} are ^{in the} form of oblong spots composed of fine wavy lines radiating outward from a common center.

Like this - . I have observed them most frequently on Finbacks, & Sei whales; and they were present on nearly all of the Finbacks ~~taken~~ which I observed in Alaska & Vancouver Is., altho' not to such a great extent as in the Japan whales. I was sure this was ^{caused by} a parasite of some sort but only had never seen the animal before.

On this whale a great many were present and there were many scars in different stages - some containing the parasite & some almost healed. The ~~parasite~~ parasite apparently fastens to the skin & travels a short distance forward going deeper ~~into~~ into the blubber as it proceeds. This is the whole central

197

This is however a
different parasite which
affects the Blue Whales
which I believe to be a
~~single~~ ^{single} ciliated. It
leaves a cup-shaped depres-
sion, ~~the~~ sometimes lined
with a ~~green~~ membrane
having a granular surface.
This seems to be mostly on
blue Whales - at least I
have not seen it on
Finbacks or sei whales.
I remember of having
seen one Humpback in
Alaska which has the
same scar as I have
described below - probably
caused by the same
parasite!

See also No. 23-24

- Length of skeleton
- Length of skull (straight)
- Breadth .. greatest
- Length of rostrum
- Breadth .. at middle
- Length of mandible (st)
- " " .. curved
- Breadth of orbit least
- " " .. greatest
- Length of nasal

line of the scar. The fine wavy lines which radiate
out from the center are apparently ~~caused by~~ formed
during the healing process after the parasite has left the
host. At the bottom of each scar ~~which~~ contained a parasite
was a sack containing more or less ~~free~~ pus. The
parasites were embedded to about $1\frac{1}{2}$ inches in some ^{places}
& in others had travelled a semicircular course
appearing again about 2 inches from the point of
entrance. The parasites are about 8 inches long with
a transverse "head" which embeds itself in the blubber.
(They can be described later as many were preserved.) They
could be pulled out with difficulty. They were most
plentiful on sides of peduncle but were on top of rostrum,
lips & back as well - ~~but~~ few on the breast folds.
Some of the scars were irregular & branching while line,
& did not have the wavy transverse lines radiating
out from them - the majority, however, were
of the oblong type. ^{Many of} These scars on the Blue & sei
whales are caused by the same parasite I am sure
see above

In British Museum is a skull of Megaptera from California.

Humpback
with barnacles

One barnacle (Cornuula) was present on the top of the head of a Humpback 42 ft long taken at Akkaera June 10. This same whale had sustained an injury apparently to the upper surface of the snout. The epidermis was in the form of round "islands" about 4 inches in diameter - sometimes isolated - sometimes the edges touching. These were situated on a yellowish white granular surface. This was also present in one or two places near eye. It may have been caused by a parasite of some sort, but I believe it was from external injury. The whole top of the head was marked with long, narrow whitish streaks which were apparently scratches.

Humpback

Whale no 21 had a pink spot on breast - I observed the same thing on one or two Van. Humpbacks.

Porpoises

While in Alaska (1908) I several times saw in Alaska schools of a black + white striped dolphin which I am certain was Lagenorhynchus crucifer. I was close to them & had good opportunities for observation.

~~The genus was added.~~

~~Finback white part of baleen~~ The length of the white portion of the baleen row in Finbacks is necessarily of some what indefinite determination, in some individuals, the ^{transition's} separation between the light & dark portions was abrupt - in others there was a gradual shading off from the white into the dark, the plates of transition having half their external edges white & half dark.

~~length of baleen plate~~ All of my measurements of "Length of longest ^{plates} ~~part~~ of baleen" are taken along the inside of the plate from the gape to the tip not including the bristles.



length of longest baleen plate

True does not state how this measurement was taken in his specimens.

~~Finback ? Blue~~ The sternum of an adult ~~Finback~~ which I photographed at Aikawa Japan is most nearly of the shape of Fig. 21, page 141 True's "Whalebone Whales". It is half way between Fig. 21 (page 141) & Fig. 49 (page 187).

~~Finback skin~~ The outer layer of the epidermis of Humpback is much thicker than that of either Blue, Finback or Sei whale.

Apr. 1st by June 3rd, Aug. 31st & Oct. 2nd Nov. Dec. Jan 3¹ Feb 2nd

6	4	1-29	39	24	21	69	16	14	11	8	18	18
5	3-31	28	26	23	29	28	16	13	10	17	17	17

Jacobsen
Humpbacks

~~Capt. Jacobsen~~

Capt. Jacobsen & his son both believe the Humpback to be the most widely distributed of the large whales.

All the whaling captains say that the Humpbacks & Blue Whales are the first to leave the hunting grounds — that is they are frightened away much quicker than the sei whales & finbacks.

Schrods

Sperm Whales

They tell me that here at Aikawa in August & Sept. the Sperm whales are in schools of from 100 to 200 individuals. Capt. Jacobsen & his father both agree that in these two months many times one will find schools of five or six females & only one big bull sperm.

Jacobsen
Porpoises

Capt. Jacobsen tells me that he sees many porpoises out side near Aikawa & that he recognises at least three kinds — one of which does not have a dorsal fin. Probably this is *Tursio borealis* ~~macrourus phocoenoides~~

Ellefsen
Sei Whales

Capt. Ellefsen says that the Sei whales here are larger than those at Norway. All gunners agree that they look the same as the Norwegian specimens.

20	Nov. 6	♂	St. Cyp	Johan	True	
23	" 9	1845 -	21.5" 0	22.2 7°	21.9 7°	
24	" 10	1980 -	22.2 "	18.4 3.8 7°	19.3 2.6 7°	3.5
11	" 11	1805 -	20.0 "	var.	var.	<u>2.6</u> <u>1.7 diff.</u>
14	" 12	1860 -	21.0 "	34.1 7°	33.7 7°	
ar.	" 13	1860 -	20.9 "	34.6 "	33.7 7°	
24	" 15	1135 juv.	(17.6)	31.4 "	30.8	
12	" 16	1910 -	18.4 "	35.0	34.5	3.6
16	" 6	1865 -	8.5 to Dorsal	34.3	32.3	2.2
	" 9	1845 -	74.5 7°	3.6 7°	2.2 7°	<u>1.4 diff.</u>
ar.	" 12	1860 -	76.9 "	var.	var.	
76.0	" 13	1860 -	76.0 "	3.6 7°	2.2 7°	
	" 15	1135 juv.	(70.9)	3.6 7°	2.2 7°	
	" 16	1910 -	77.4	3.6 7°	2.2 7°	
	" 17			3.6 7°	2.2 7°	
	77.4			3.6 7°	2.2 7°	
	74.5			3.6 7°	2.2 7°	
	2.9 7°			3.6 7°	2.2 7°	
	4.3			3.6 7°	2.2 7°	
	2.9			3.6 7°	2.2 7°	
	1.4 diff.			3.6 7°	2.2 7°	
	Fair tip & humerus			3.6 7°	2.2 7°	
" 6	-	12.3 7°		3.6 7°	2.2 7°	
" 9	-	12.1 " 12.2 7°		3.6 7°	2.2 7°	
" 10	-	12.2 "		3.6 7°	2.2 7°	
" 12	-	12.4 "		3.6 7°	2.2 7°	
" 15 juv.	(12.2)			3.6 7°	2.2 7°	
" 16	10.7" tip imping			3.6 7°	2.2 7°	
	12.4			3.6 7°	2.2 7°	
	12.1			3.6 7°	2.2 7°	
	13 7°			3.6 7°	2.2 7°	
	var.			3.6 7°	2.2 7°	
	11.2 7°			3.6 7°	2.2 7°	
	1.9 var.			3.6 7°	2.2 7°	
no 6	-	summit to dorsal		3.6 7°	2.2 7°	
	18.6 7°	19.0		3.6 7°	2.2 7°	
" 10	-	19.0 "	15.9 7°	3.6 7°	2.2 7°	
" 11	-	17.1 "	3.1 var.	3.6 7°	2.2 7°	
" 15 juv.	(14.9)	True	19.7	3.6 7°	2.2 7°	
" 16	15.9 "	17.2 7°	11.6 - 2.6	3.6 7°	2.2 7°	
	17.4 7°	21.5 var.	ar. 2.9 7°	3.6 7°	2.2 7°	

\$ 224.
\$ 104.00
\$ 333

Blue Devil Fish = } marine toben
White .. " - } finn blubber \$ 00
Ordinary .. : 4000

white from blubber
blue from outside

Robt. Collet On the external charact.
of Rulephius Porpoise B. borealis lesson
P. J. S. 1886 pp. 243-265-pls. 25-26

J.Y.
21
33

H. Ellefsen
Skjulstok
stokke stt.
. Norway

1 can 2.50

40 cans
40 lbs

Gundersen v.g.
A. Kitterson
Nelson v.g.
M. Hansen v.g.
H. Hansen v.g.
O. Bogen g.
N. Spontorf v.g.
H. Ellefsen g.
F. Oleson v.g.
A. E. Henningsen v.g.
Reidar Jacobson g.
M. Jacobson g.
J. Jorgensen
N. Bogen . g.
J. Jorgensen g.
K. S. Samualsen g.
C. Farsen v.g.
Y. E. Andersen v.g.
F. Gjertsen v.g.
A. Augustine v.g.
Nielsen g.
Finback

winter Finback 60 ft worth

about \$ 5 or 6 000

winter Sei 40 ft worth

\$ 16.00

winter Humpback worth
40 ft. \$ 6 000

winter Blue 75 ft. worth

\$ 4 000 or 5 000 - 85 ft
about \$ 8 000

winter Sperm 40 ft. worth

\$ 25.00 - about same
in summer also because
meat not good to eat.

Summer

Sei whale about 5000 lbs

Finback " \$ 15.00 to 18.00

oil Blue whale
bones only 160 cans
\$ 2.50
8000
320.00
1400.00

oil Sei
bones 5 cans
only \$ 2.50

oil Humpback
bones 25 cans
only \$ 2.50

Fugimura Kaisha
Toda Hogen Kaisha
Kissusah Kalenshiki Kaisha

Kamaishi

Y. E. Andersen
Aarösund Paröd
pr. Tönsherg
Norway

S. Samualsen
Österbek Nötterö
pr. Tönsherg
Norway

Snout to eye -
" blowholes -
" pectoral -
" dorsal -
Pectoral tips to humerus
" broad th -
Dorsal height -
Flukes tips to tip

Am.	Europe	Japan
20.6	20.1	20.8
18.4	18.1	17.4
33.2	33.4	33.7
77.1	76.0	76.0
12.2	12.5	12.2
2.9	2.9	2.9
2.4	2.3	2.1
22.4	20.1	22.4

sometimes as high as 75¢ red meat about 6¢ per lb.

Humpback meat best of all					
about 3-00 lbs baleen in one Blue whale					
100 lbs	70 or 80	"	"	"	See
"	300 lbs	"	"	"	Finback
"	100 "	"	"	"	Humpback
"	25 or 30 "	"	"	"	Cal. Gray whale

100 lbs Blue whale	baleen	worth 8 yen	Oriental Whaling Co
100 "	Finback	" 10 " "	
100 "	Sei whale	" 3 " (not rare)	
100 "	" "	" " "	
100 "	Cal. Gray	" 20 "	
100 "	Beaked	" 420 "	

100 lbs fresh blubber worth	4 yen	(winter) to eat	Blue whale
" "	" "	"	Finback
" "	" "	7	Humpback

Tail worth 100 lbs about 8 yen of all whales

On winter to eat
100 lbs, fresh red meat, worth 12 yen of all whales

Wages of Quinners

* \$100 to \$200 per m.s. winter Oct. to April.

according to rating : Bonus; Blue, Humpback + Finback = \$55.
of quinners. Sperm Sei & Cal. Gray = \$40

Summer, Oct. 1st. to Apr. 1st.

Bonus: Blue Finback + Humpback = \$40

Sperm Sei whale = \$32

Cutters get wages of

\$13 to \$15 per m.s. + board

Bonus whale longer than 50 ft = .50 sen

" shorter " i. = .25 sen

Cutting Foreman gets

wages \$78 per m.s.

sta

12) Wainihon Susasari Koh, Kaisha

8) Nagato Hogen "

sta 18 da at Akawa

18) Togo Hogen Kabushiki Kaisha

2) Kiususan Kabushiki "

Fujimura Goshi "

3) Tosa Hogen Gomei "

at Ojinotahama

2) Nagao Susasari Kabushiki Kaisha

Wakito Gyogo "

Togo Hogen "

